GAS

JULY 1947

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT

THE RIGHT COMBINATION

ROCKWELL-EMCO EJECTOR SERVICE REGULATOR

Fitted with a new streamlined pressure cast aluminum alloy cover and inspection plug. Designed to automatically boost outlet pressure in direct proportion to increased demands. Has greater capacity than previous designs and extremely low lock-up characteristics.

Ask for bulletin 1126.

NORDSTROM LOCK WING SERVICE COCK

Made with semi-steel body and brass plug. Has lubricant screw and patented "Sealdport" lubricant system for positive sealing against leakage while providing operating ease. The drilled wing permits padlock protection.

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The first meter to be produced with a durable, non-corrosive pressure cast aluminum alloy case. Light weight saves in shipping costs and handling effort. Simplified, improved mechanical construction provides greater accuracy, longer life and minimized maintenance.

Ask for bulletin 1100.

GET MAXIMUM SERVICE SATISFACTION AT LOWEST COST PER CUBIC FOOT MEASURED

Here's a domestic meter setting that's as clean as a hound's tooth. Its very appearance bespeaks efficiency. And the performance of this Emco-Nordstrom combination is fully in keeping with its modern styling. For Rockwell engineers have joined hands to bring gas utilities only the best in materials and construction; the latest in design technique. For a full measure of satisfaction, measure the Emco-Nordstrom way. You'll get greater accuracy and a longer useful life.

PITTSBURGH EQUITABLE METER DIVISION

ROCKWELL MANUFACTURING COMPANY, PITTSBURGH 8, PA.

ATLANTA BOSTON CHICAGO HOUSTON KANSAS CITY LOS ANGELES NEW YORK PITTSBURGH SAN FRANCISCO SEATTLE TULSA

"CBV" COMBINATION BALANCED VALVES
For Precision in Gas Regulation!

The right gas pressure with continuous control is a prime need supplied by the "CBV" type regulators. These are combination balanced valves built in two interchangeable styles—either offset connected or direct connected.

The offset model allows easy access to inner valve assembly through a hand hole plate. It does not require removal of the entire superstructure to examine or change the valve assembly. In changing from a high to a low pressure regulator, the diaphragm chamber unit is replaced and the rocker arm shaft is changed to a low pressure rocker arm shaft. The offset connected style has a fulcrum between the diaphragm and valve assemblies.

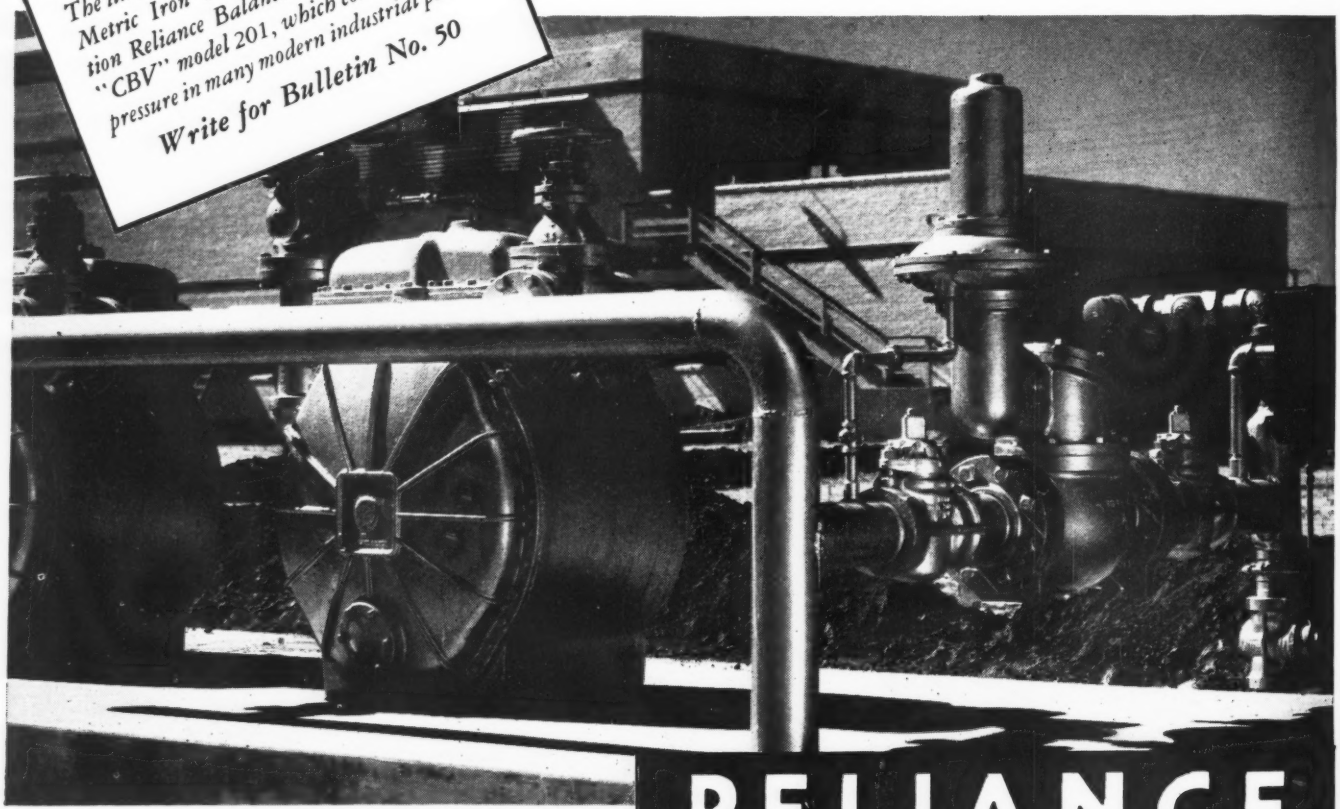
In the direct connected regulator, the diaphragm assembly is connected straight through to the valve assembly. It comes in three optional types: the high pressure weight-loaded; spring-loaded; or pilot-loaded. This model also has interchangeable parts which permit switching to a spring or pilot-loaded assembly. The change is made by replacing the pressure lever cap with the spring housing unit or with the pilot cap. These quick and easy changes help to meet new needs and specifications.

Both offset and direct connected models are offered in high pressure weight-loaded, spring-loaded, or pilot-loaded types. Low pressure models are pilot-loaded or weight-loaded, either inside or outside weights being available. Semi-low pressure regulators are made in pilot-loaded or outside weight-loaded types. The low pressure and semi-low pressure regulators are offered only in the offset style. A 3.4 to 1 ratio is maintained to provide better lock-up under low pressures.

Valve body castings are the same for either high pressure or low pressure types. A free flow of gas is provided at the point of expansion and body friction is reduced to a minimum. Directional flow arrows are cast into both sides of valve body castings for the user's convenience.

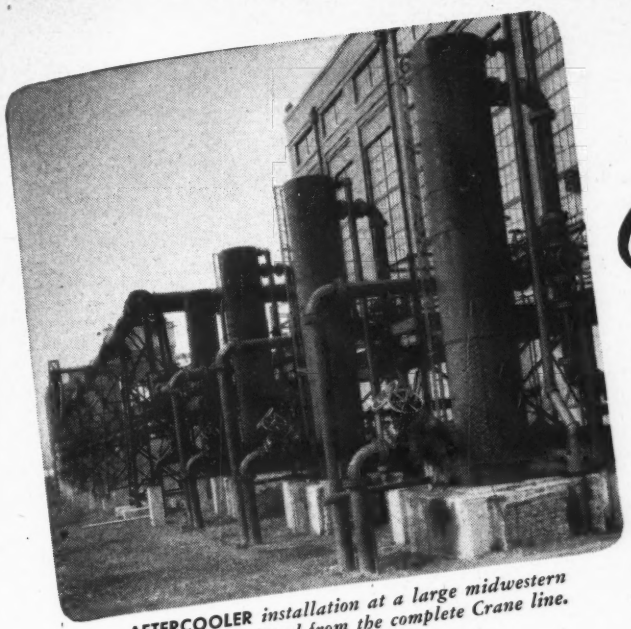
The illustration below shows an American Metric Iron Case Meter and combination Reliance Balanced Valve Regulator, "CBV" model 201, which controls the gas pressure in many modern industrial plants.

Write for Bulletin No. 50



American Meters

RELIANCE REGULATORS



AFTERCOOLER *installation at a large midwestern gas plant, equipped from the complete Crane line.*

If it's a piping item you need *Crane* supplies it

Keep that in mind for a fast start and good finish on every piping job. On a single replacement or a complete new installation . . . see Crane first for all the equipment you need . . . and the quality you want in every item.

All piping work is simplified . . . from design to erection to maintenance . . . when the complete Crane line is your partner. Specifying goes faster . . . buying is easier. One order to your nearby Crane Branch or Wholesaler gets all the materials. And you get a 3-way advantage that keeps pipe lines at peak efficiency.

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RESPONSIBILITY
STANDARD OF QUALITY

1. **WORLD'S LARGEST SELECTION** of valves, fittings, pipe, accessories, and fabricated piping—in brass, iron, and steel—for all power, process and general services.

2. **ONE RESPONSIBILITY** for piping materials—helping you to get the best installations, and to avoid needless delays on jobs.

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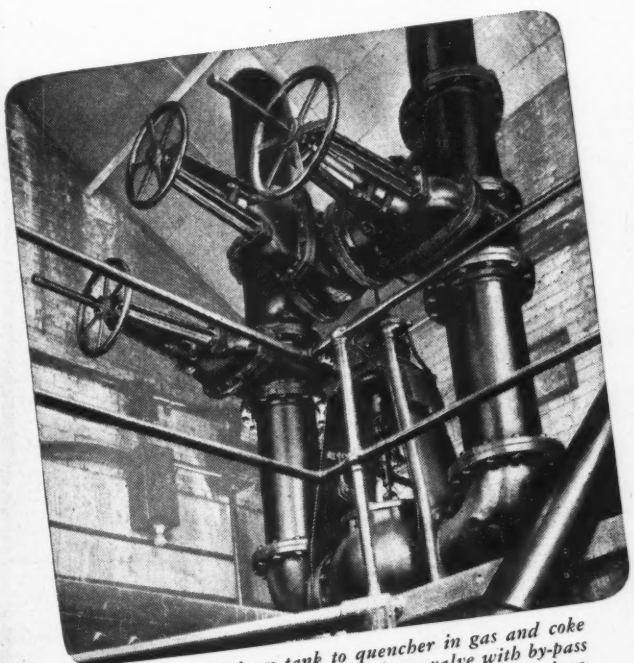
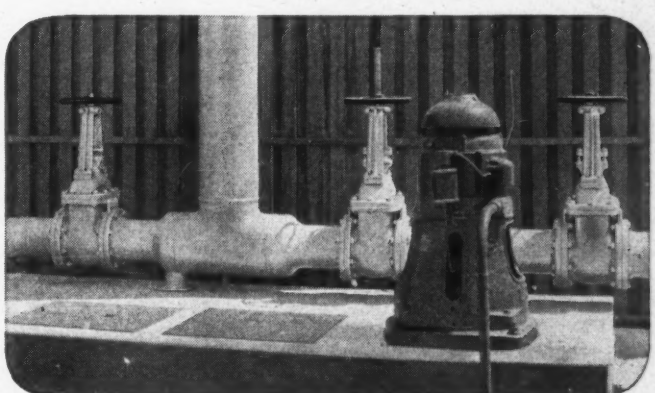


WATER LINES *from tank to quencher in gas and coke by-products plant. Shows regulator valve with by-pass using Crane 125-lb. wedge gate valves and fittings.*



COOLING TOWER *at a gas line station, featuring Crane 8-in. standard iron body wedge gate valves in the water system.*

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PLUMBING
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Highlights

STATES PASS UTILITY LABOR LAWS. At least seven states have effected laws curbing labor's power in public utilities in varying degrees. Most complete is Missouri's bill which sets up a five-man mediation board. If mediation fails, the state may assume operation of the utility and forbid strikes under heavy penalty . . . Michigan has a new antisabotage bill to protect utilities . . . Ohio's new law would automatically dismiss any employee of publicly-owned utilities for striking . . . Nebraska has the stiffest. It makes arbitration compulsory. State courts are given jurisdiction to make decisions needed to settle disputes . . . Wisconsin was expected to pass compulsory arbitration . . . Florida and Pennsylvania have already done so.

SOUTHERN NATURAL GETS GREEN LIGHT. The FPC has issued an interim emergency certificate for construction of facilities designed to boost capacity by 39 MMcf daily. Only existing markets will be affected.

EAST OHIO PLANS TO APPEAL RULING ON RESTRICTION. Common Pleas Judge C. V. D. Emmons last month granted a permanent injunction prohibiting the company from turning off a consumer's gas at the street. R. S. Newman had brought suit because after he had installed a gas conversion unit in his Akron home last March, East Ohio had demanded it be disconnected or a medical certificate be produced, he said. The judge held the company's action to be in violation of the franchise issued last year.

FPC UPHELD IN INTERSTATE NATURAL CASE. In a unanimous decision rendered June 16, the Supreme Court upheld the right of FPC to regulate gas produced in one state and delivered by the producer to a second company for interstate transmission. The court saw no conflict of FPC regulation with the rights of the state of Louisiana in controlling production and movement of the gas, as claimed by the gas industry. The appeal to the high court was instituted after FPC had ruled that rates charged in sales of gas to three pipe line companies were "unjust and unlawful" and ordered reductions aggregating $600,000 a year.

FPC WINS AND LOSES. An opinion handed down by the U. S. Court of Appeals for the District of Columbia in the Mississippi River Fuel Corp. case backed up the commission for limiting returns to 6%, but reversed the commission on its formula for segregating the pipe line company's sale of gas to public utilities for resale from sales to industrial consumers. The former are subject to FPC regulations, the latter are not; and the court held that the commission was inconsistent in that it did not follow its own theory. FPC had held that although certain costs were dependent upon capacity, it would be erroneous to assign these costs solely to demand.

CONSERVATION OF GAS. Dedication last month of a new gasoline plant in the West Ranch Field near Vanderbilt, Texas, by Magnolia Petroleum Co. marked completion of facilities expected to utilize about 25 MMcf per day of flare gas. Railroad Commission Chairman E. O. Thompson, ardent champion of conservation, turned the master gate setting the plant in operation. Residue will go to Beaumont.

HIGH STEEL PIPE EXPORTS CRITICIZED. Charges that exports of steel are out of line are coming in for senatorial scrutiny. Sen. Moore (Rep., Okla.) came up with figures showing that exports of seamless and welded pipe during the first quarter reached an all-time high of 82,250 tons, an increase of 411% over prewar quarterly averages. Russia alone received 30,000 tons. With exports hampering oil exploration and gas delivery, the Senate Small Business Committee is considering solutions.

GAS LOSES FIRST USER. Allegheny Ludlum Steel Corp. at its West Leechburg, Pa., steel mill has converted to oil. It was here that gas was first used in steel mill operations, in 1874.

ANOTHER COMPACT. Three states—Texas, Oklahoma, and Kansas—may enter into an interstate compact to promote conservation and utilization, Texas Gov. Beauford Jester has hinted. He and Oklahoma Gov. Roy J. Turner have agreed to consider such a pact. Uniform taxes on gas production in the three states to promote conservation through orderly withdrawal would be a primary objective.

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CHEMICALS
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THE NAME TO WATCH IN CHEMICALS

ALERT—THE CONCENTRATED GAS ODORANT

Because it is *Stable* and *Highly Diffusible* under normal gas conditions, it protects two ways: saves maintenance costs; guards against undiscovered gas leaks.

Alert's pronounced gassy odor stays "put"—½ pound will odorize up to two million cubic feet of gas.

Packed in drums containing 375 pounds—enough to treat 750 million feet of gas—under normal conditions.

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TYPICAL TESTS:

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Weight Lbs. per Gallon	6.9
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Distillation Range (D-86):	
Start	117° F
10%	130
50%	149
90%	208
End Point	280
Recovered	98%
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ALERT...by makers of Calodorant ...the oldest name in gas odorants

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TECHNICAL TRENDS

by Guy Corfield

Technical Licensing

THERE has been considerable recent discussion on the pros and cons of state or other licensing, registration or certification of technical workers. The American Chemical Society has recently conducted a poll among its membership to determine the reaction of the chemist to such a movement.

Numerous questions were asked and some 21,000 replies were obtained. Various breakdowns of the information were made, the following results being developed from three leading questions as answered nationally, and in four representative states:

1. Are you in favor in principle with state licensure of chemists?

The majority of the answers were no, as follows: Nationally, 79%; Illinois, 77%; California, 74%; Ohio, 68%; New York, 79%.

2. Do you favor compulsory licensing of all chemists?

Again the majority voted in the negative: Nationally, 86%; Illinois, 83%; California, 81%; Ohio, 83%; New York, 86%.

3. Do you favor compulsory licensing of only those chemists in responsible charge and supervision of such work as involves public safety and public health, and permissive registration of all others?

The answer was again no: National, 60%; Illinois, 60%; California, 69%; Ohio, 60%; New York, 66%.

The above data, and the additional detail given in the report of the poll, makes it appear rather definitely that there is no predominant desire for licensing within this representative technical group.

Radioisotopes As Tracers

IN this column, last month, mention was made that the Monsanto Chemical Co. was actively engaged in production of radioactive chemicals including isotopes that could be used as "tracers" in many fields of science and industry. In a recent address, Charles Allen Thomas, vice president of the Monsanto Chemical Co., discussed these "radioisotopes" in some detail.

A few of the most adaptable isotopes, produced by fission in the uranium pile, are hydrogen 3, carbon 14, sodium 24, phosphorus 32, sulfur 35, chlorine 36, iron 55 and iodine 131. Examples of use in chemical engineering

in fields of interest to the gas industry are: to obtain binary equilibrium data and vapor-liquid information in distillation processes; to determine the required number of plates in a high-efficiency fractionating column, by analysis for purity at the top and bottom of the column; to follow impurities through distillation and fractionation processes, or scrubbing or purification of gases, to obtain analytical data and process control; to detect the presence of finely divided solids in liquids, as a means of observing separation efficiencies in centrifugation, filtration and the settling of precipitates; to obtain the linear velocity of liquids or gases in pipe lines, by measurement through the pipe wall, by means of appearance of radioactivity at two points along the pipe length; and to ionize the air to neutralize static electricity at points where it may be generated and constitute a hazard.

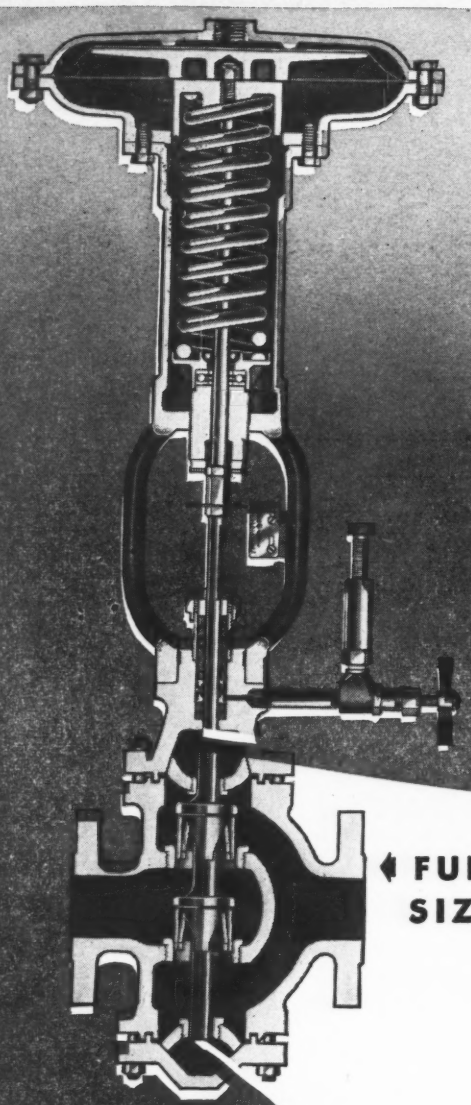
Some difficulty will be encountered at present in obtaining adequate instruments for radioactive measurements and health protection, and research groups will have to develop experience and technique; but, according to Thomas, "For progressive groups there is little need for long delay in taking advantage of one of the most important research aids ever developed."

British Engineering Center

WHAT is said to be the world's first "engineering center" is to be opened in Glasgow, Scotland, in September 1947, under the auspices of the Institution of Gas Engineers and some 40 other British scientific, trade and technical organizations. It is to be a permanent exposition of materials, methods and machinery, to offer unbiased advice and to promote cooperation among all those engaged in engineering.

The aim of the directors is to obtain a multiplicity of exhibits by participation of 300 to 400 firms who would each spend the equivalent of about $500 per year. Salesmanship will be barred, but private rooms will be available for consultations and discussions. The center will have no financial interest in transactions that may result. The exhibits will be open to everyone interested, and it is the aim of the sponsors to develop a cultural center for British engineering.

This would seem to be an extremely interesting and progressive project that might well be emulated elsewhere.



RESTRICTED INNER VALVE PROCEDURE FOR FISHER DIAPHRAGM CONTROL VALVES . . . . . .

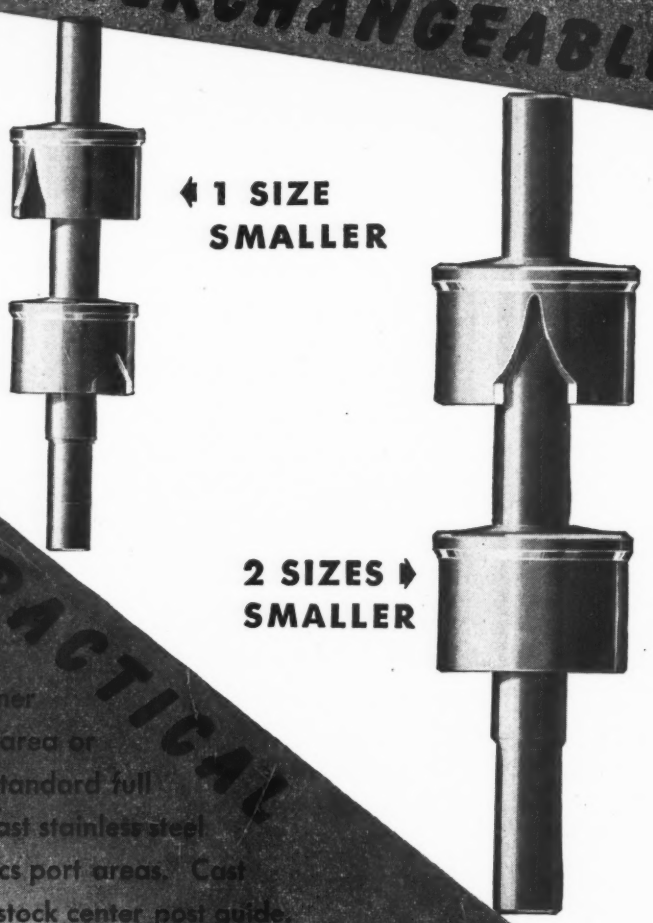
The introduction of Fisher's new restricted inner valves offers a quick, economical and completely satisfactory way to reduce the effective capacity of a larger nominal valve size.

INTERCHANGEABLE

FULL SIZE

1 SIZE SMALLER

2 SIZES SMALLER



PRACTICAL

For example, a 4" valve can quickly be converted to flow capacity of a 3", 2½", or 2" size. This is accomplished by the restricted V-Port Inner Valve alone—without changing seat rings. Inner valves with equivalent smaller size valve area or capacity are fully interchangeable with standard full size inner valves. Inner valve skirts are cast stainless steel with wide range percentage characteristics port areas. Cast skirts are welded on to stainless steel bar stock center post guide. Further details and application data gladly furnished on request.

FISHER GOVERNOR COMPANY MARSHALLTOWN, IOWA

PROMOTIONAL NOTES AND NOTIONS

by Stanley Jenks

Fringe Territory

IN the May issue of BUTANE-PROPANE NEWS, there is an article of the utmost interest to those gas utility sales managers with a fringe territory development problem. The author is E. C. McEneany, Diablo Co., Walnut Creek, Calif.

Mr. McEneany tells how his company, in its capacity as an LP-gas distributor, in 1939 successfully worked out a cooperative plan with R. L. Hayden, then Contra Costa division manager of the Coast Counties Gas & Electric Co., and now general sales manager, to handle uneconomic fringe territory until conventional piped gas service could take over.

The problem was serious, because the gas company was faced with the possibility of being hemmed in within what were then its distribution limits by a barrier of all-electric homes. How this was foiled to the mutual profit of the gas company and the LP-gas dealer is Mr. McEneany's story. It is a first-class story of real cooperation on an intelligent level.

Be sure to read it.

Dealer Profits

ANOTHER British gas executive, in a paper at a gas conference in Wales this February on the subject of "Salesmen's Problems," was quite concerned about a domestic market flooded with electric space heaters, displayed and sold by radio dealers, bicycle dealers, hardware merchants, furniture dealers, and many others.

His advice to his colleagues was that dealers should be encouraged to sell gas appliances, but he warned that they (the dealers) in return will expect a profit of 27.5%.

"It is no use offering them discounts of 10%," he said.

So there we go again. The appliance dealer's interest in any fuel-using appliance is proportional to the profit he can make selling it. His only obligation to us is to sell a quality product, and this the worth while dealer does anyway as a matter of self-interest.

Competitive Costs

THE British have recently been arguing in the daily press the comparative costs of gas and electricity for cooking and other domestic heating applications. M. Milne Watson of London apparently started things during the British coal crisis last winter by prducing figures to show that it took twice as much coal to produce one Btu electrically as by using gas. Mr. Watson argued that it took 20

kw. hrs. to replace one gas therm for domestic heating purposes.

Assuming this ratio is reasonably accurate, it can be used effectively by gas service salesmen in the face of electric heating or cooking appliance competition. Gas at even 10 cents a therm (i.e., natural gas at $1 per Mcf) will provide twice as much effective heat as 20 kw.-hrs. of electricity at 1 cent per kw.-hr.

It is a favorable ratio for gas, and, with our fuel's many other advantages over electricity, it is an argument which should be used whenever needed, but probably as a last resort, because most people are far more interested in the better performance of an appliance than the actual cost of operation.

Salesman Defined

HARRY G. Mook, vice president, Chrysler Corp., knows how to sell automobiles, and he has definite ideas on the type of man needed to sell in his field. In a Los Angeles sales conference this year, attended by 1200 salesmen, he described his ideal salesman this way.

> He has the curiosity of a cat, the tenacity of a bulldog, the friendliness of a little child, the diplomacy of a wayward husband, the patience of a self-sacrificing wife, the enthusiasm of a Sinatra fan, the assurance of a Harvard man, the good humor of a comedian, the simplicity of a jackass and the tireless energy of a bill collector.

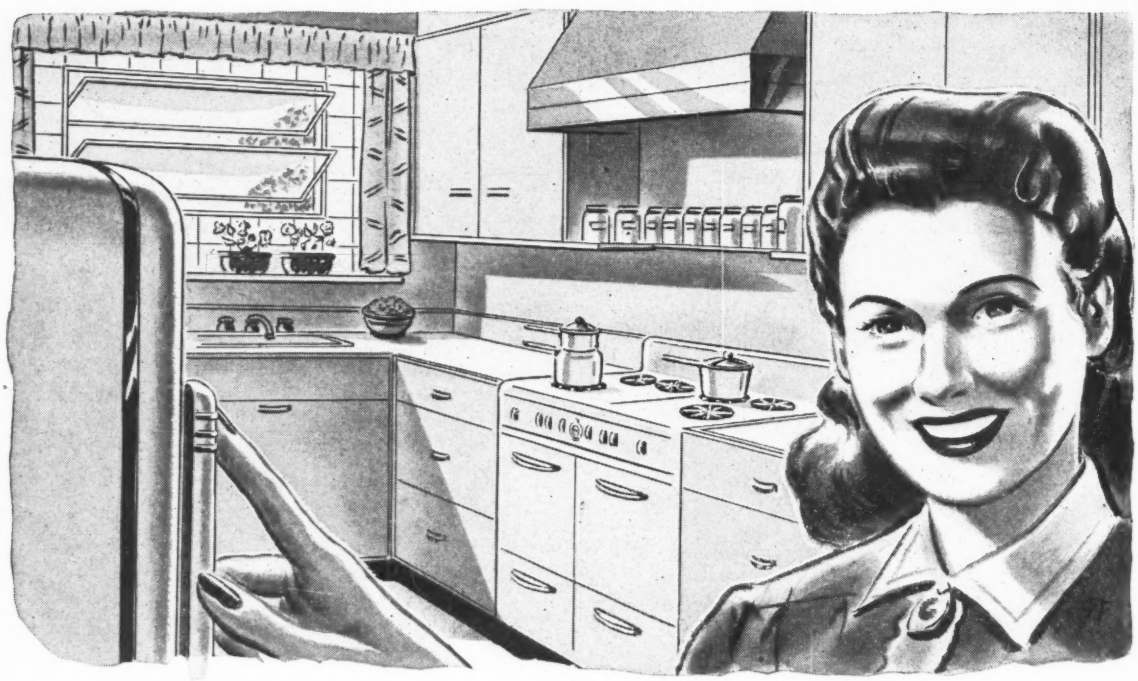
Really! It sounds like an awful lot to ask of any wayward mortal. Make a note to look for the wing-bulge on the next Chrysler salesman you meet. In the meantime, in the gas industry, I think most of us would be glad to settle for a salesman whose loyalty is beyond doubt, who thoroughly knows the value of gas service, and who is whole-heartedly willing to work.

House Heating Report

AN official report, recently released in Pennsylvania, shows that better than 90% of those applying for home building permits want to use gas for central heating.

CLEAN GAS

CREATES PUBLIC *Demand* FOR GAS



Perhaps the reason why your public does not *demand* gas above other fuels, is because your gas is dust-laden, causing troublesome and expensive service complaints.

Clean gas eliminates service complaints, reduces wear and tear on equipment, and stops hidden losses from faulty metering and poor regulation.

Mere *public acceptance* of gas changes to real *public demand* for gas when you install Blaw-Knox Gas Cleaners at strategic points in the distribution system.

BLAW-KNOX DIVISION of Blaw-Knox Company

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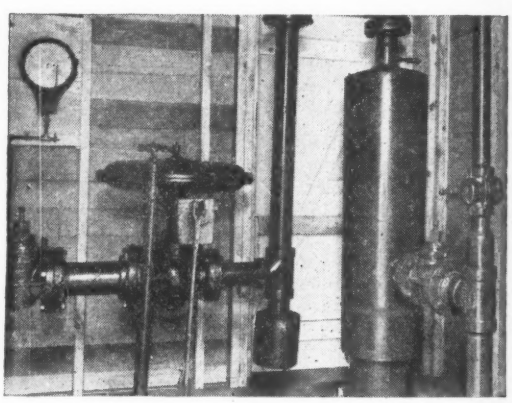


Blaw-Knox Model "K 15 L" Gas Cleaner protecting and insuring clean gas at a regulator station. Larger units are available up to 72" diameter working 800 lbs. gage pressure and beyond.

BLAW-KNOX
GAS CLEANERS

Blaw-Knox designs, manufactures and erects —Compressor Stations—Propane-Air Stations —Absorption and Stripping Plants for removal of Naphthalene, Gums, Tar and Light Oils from manufactured gas.

Ask for Catalog No. 1869.

GEORGE S. JONES, JR.
Guest Columnist

Keep Selling the IDEA of Gas

By GEORGE S. JONES, JR.
Vice President in Charge of Sales
Servel, Inc.

I have been increasingly alarmed at the effect of present publicity on this industry of ours—and on the attitude of the public toward it. Why the news columns of the public press seem to have focused on the predicament of present difficulties in the extension of gas transmission and distribution I do not know. There are shortages of supply in electricity and other fuels, but the gas industry has been so well advertised that the public is conscious only of gas shortages. The electric industry is urging increased activity on the part of their members in order to take advantage of this public attitude.

Of more serious import is the effect on the gas industry management—on plans in general and on sales planning in particular.

In many instances present conditons call for new policies and new strategies. This is a concern of general management. It may be a paradox to state that general management from the standpoints of policy and strategy should give more attention to sales and merchandising at times when selling as such is not so obviously needed. But while that may apply to the overall picture, there never has been a time in our industry when more attention to the problems of sales strategy has been needed than right now.

In some areas limitations exist as to sale of new heating equipment. In all sections of the country new construction is proceeding under the most discouraging handicaps. Manufacturers of heating equipment are suffering seriously; and sales departments in many utilities are stagnant and deteriorating under lack of incentives to sell. Here is a challenge to top management to help direct a new sales strategy. For there are no limitations to the possibilities of the replacement of outmoded, inefficient and actually broken-down gas furnaces. There is a tremendous opportunity to replace these older and less efficient gas furnaces with modern, efficient ones, to the betterment of every phase of our industry. Your customer would benefit by getting more service from his gas bills. The gas company conceivably could materially lower its winter peak. The manufacturer could avoid expensive and even disastrous shutdowns—and, from the standpoint of training a sales organization for the terrific competition in all fields that is only months away, it would repay every investment in time and money and in the attention of the top strata of management. Tomorrow's salesmen must be trained today. A sales organization—like other organizations—must go through a period of gestation. It's a difficult procedure to hasten. You may want to create a functioning sales organization in a week, but it takes months. Shortly, hard-hitting salesmen and sales planning will be needed for our old standbys of refrigeration, cooking and water heating, as well as space heating.

But gas has greatly enlarged the dimension of its service in the past few years. Have you given thought to the new jobs that are still to be done in the gas industry? The New Freedom Gas Kitchen—a program that for the first time really identifies and distinguishes the *gas* kitchen? Have you given full consideration to the real import of the automatic washing machine and its great need for increased hot water—for water heated by *gas?* Have you fully realized the market for house heating being daily created by the increasing costs of other fuels and the desires of the public to be less dependent on the whims of a John L. Lewis?

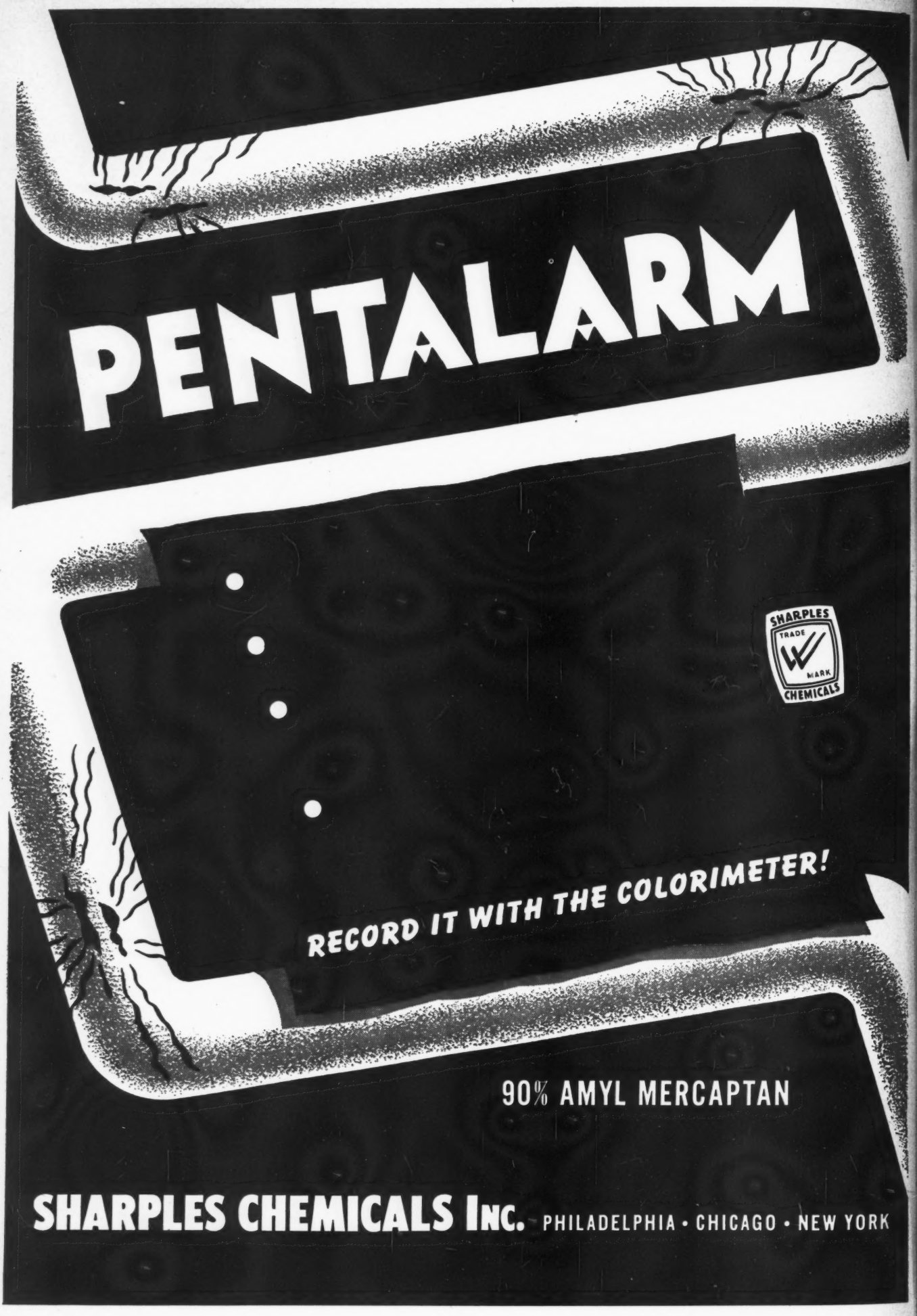
Let's talk about air conditioning for a moment—about all-year *gas* air conditioning.

It's true that building restrictions have kept low the market in new constructions. But probably by the time you read this these restrictions will have been removed or raised. It's true that—along with gas heating equipment of all kinds—progress has been hampered by ability in some areas to replace other forms of house heating in existing construction.

But there is no restriction anywhere—except in the lack of definite sales plans—to the replacement of existing gas furnaces with this better quality of living. There is no restriction to *improving* the service to your customers *where that service does not increase the winter peak.* There is a great selling opportunity in the substitution of all-year gas air conditioning for existing gas furnaces. Here is a unit that brings summer comfort cooling to go hand in hand with high quality heating. Here is a unit that becomes the greatest of all salesmen for gas service. Such a program has a natural follow-through, for if the prospect is unsold he is certainly receptive to a new gas furnace replacement.

The electric industry is making a tremendous effort to promote the heat pump, as yet a promise rather than a reality. A dominating reason is thus provided for the building of a selling organization of higher intelligence that will upgrade all sales effort in the manner almost immediately required in other lines.

I have emphasized air conditioning, but the need for sales planning and sales action is urgent in all fields. There are abounding opportunities to sell in the gas industry. The limitations should not stop aggressive merchandising activities. People like to do business with an aggressive institution. A public favor has been developed that carries the obligation of further sales education toward the greater goodness of gas service. Things *can* be done. A positive attitude *can* be maintained. New strategy and policy *can* be adopted to make this year one of great advance. Let us be about our *present* opportunities.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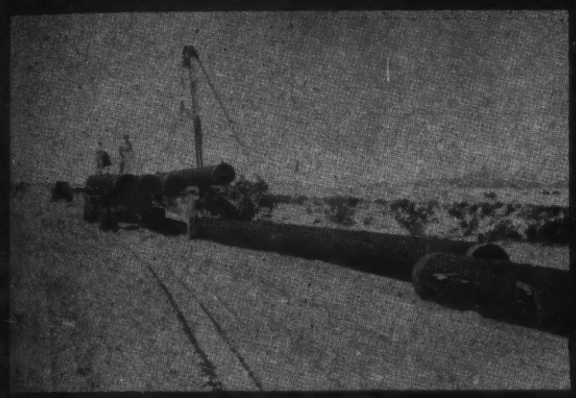


ggest Inch" Line

UNUSUAL CONSTRUCTION METHODS HAD TO BE DEVISED IN ORDER TO SOLVE PROBLEMS ENCOUNTERED

By B. M. LAULHERE

Mgr. of Engineering Service
So. Calif. Gas Co., Los Angeles

ALTHOUGH in most cases orthodox construction methods and equipment are being used in building the California section of the Texas-to-California gas transmission line, unusual problems encountered have led to the development of unusual methods. It is these in which we are at present interested, and I will deal only briefly with the ordinary aspects of the job.

We are now in the midst of the project, which entails laying a 30-in. line from the Colorado River near Blythe, at the Arizona border, to Santa Fe Springs, located just east of Los Angeles.

During the time this project was in the blueprint stage, considerable thought was given to the possibility that due to the large diameter and the thickness of the pipe wall, unusual difficulties might require new methods of installation. However, since many high-pressure transmission lines as large as 26-in. diameter and wall thickness of as low as ¼ in. had been laid with no serious difficulty, it appeared that our only unusual problem would be due to the added weight, the greater diameter and the longer joints. More and heavier construction equipment seemed to meet all the requirements.

The general contract for the installation of this line has been let to H. C. Price Co. of Los Angeles and Bartlesville, Okla. The hauling and stringing of the pipe has been subcontracted by the general contractor to Dunn Bros. of Dallas, Texas.

The job was originally divided into two divisions: Division 2, extending from the Colorado River west for a distance of 143 miles to a point west of Banning, and Division 1, extending from that point to the westerly terminus of the line at Santa Fe Springs. Division 2 is all in desert country except the eight miles in the Palo Verde Valley at the Colorado River, whereas the line in Division 1 traverses various types of terrain, including steep, broken, brush-covered "badlands," high, rolling, grass-covered hills, fields of irrigated alfalfa and other crops, orange and walnut groves, a few miles of country roads, and 11 miles in a railroad right of way. Both divisions have their share of highway, railroad and irrigation canal crossings.

The contractor started his first spread at the Colorado River about the middle of February, and this spread is to work west about 155 miles to the point where the second spread started work about the middle of April. The second spread will end up at Santa Fe Springs. It is estimated that both spreads will finish work at about the same time.

Prior to hauling and stringing the pipe a 50-ft. right of way is graded to the extent necessary to accommodate the

Presented at Transmission Conference, Pacific Coast Gas Association, Fresno, Calif., in May.

ditchers and other construction equipment. The right of way is generally 20 ft. to the left of the pipe line location—this to take the spoil bank—with the remaining 30 ft. to the right being the working strip. At the same time all necessary additional access roads are constructed or existing roads improved to permit hauling the 60-ft. joints. In many places, "shoo-flies" are required to move the equipment across the many deep canyons and gullies. The ground, which varies from fine river silt, through loam, fine and coarse gravels, and sedimentary rocks to granite, presents a real problem to the contractor both in grading the right of way and in ditching. RD-8 bulldozers are used in the grading operations, the number required varying with the roughness of the country and the type of soil. In some sections, one tractor is capable of making several miles of finished right of way per day, while in one other section seven bulldozers were able to complete less than one mile per day. The trenching is done with Buckeye 42 trenchers except in rock and coarse gravel, where back hoes are used. *Fig. 1* shows the ditcher operating in a desert area where surface indications were favorable; but digging at 5-ft. depth was in very hard material.

Unusual Methods

As I have said, orthodox methods are generally used on this job so I will confine the balance of my remarks to the unusual methods and features of the job.

THE pipe is 30-in. O.D. in 60-ft. lengths of four wall thicknesses ranging from 9/32 in. to 3/8 in. The protective coating consists of a primer coat, one coat of coal tar enamel having an average thickness of 3/32 in., and one wrap of 15-lb. asbestos felt wrapper. Eleven miles of pipe in the railroad right of way has a double wrapping. A total of 8000 ft. of ½-in. wall pipe with 1 in. of Gunite coating is to be installed under important streams.

The pipe is coated in the yard in Los Angeles and hauled to the job on trucks and trailers fitted with special bolsters lined with rubber lining from airplane gasoline tanks. Six joints are carried on each load, three of which rest in the rubber lined bolsters, with the other three being pyramided above with strips of rubber at three or four points, which separate the joints and prevent damage to the coating. Talc is applied to all rubber surfaces as a further precaution against damage.

The pipe is unloaded at the right of way by a tractor equipped with a long side boom. *Fig. 2* shows this operation. The pipe is placed on bags of sand or sawdust to prevent damage to the coating by contact with the ground. As a result of the many precautions taken in handling the pipe, very little damage has been done to either the pipe or the coating.

On the desert, the pipe is strung for a distance of approximately 100 miles ahead of laying operations, and due to the hot weather the coating softens to the extent that it is difficult to handle the pipe in the line-up and lowering operations without damage to the coating. Tests were made in the desert on two sections of pipe, one as delivered to the line, and another to which a coat of whitewash has been applied. It was found that on a day with atmospheric temperature slightly under 100°F the temperature of the section of pipe without whitewash was approximately 50° higher than on the whitewashed section. The temperature of the whitewashed section was only slightly above air temperature. Based on this test, all pipe in the desert areas is now being whitewashed, which has greatly reduced damage to the coating.

Welding

All welding is done with the electric arc making three passes, and is done by the "stove-pipe" method. An internal, hydraulically-operated expanding clamp is being used for lining and holding the pipe during the running of the stringer bead. *Fig. 3* shows this clamp as it is coming out of a joint, in position to be used for lining up the next joint. This clamp is mounted on rubber tired wheels and is propelled by a small electric motor drive, the source of current being a small portable generator. The hydraulic jack is operated by a 60-ft. handle, which extends through the section to the front.

Four stringer bead welders are used for running the stringer beads. When a joint is lined up, two welders start running the stringer bead, and when

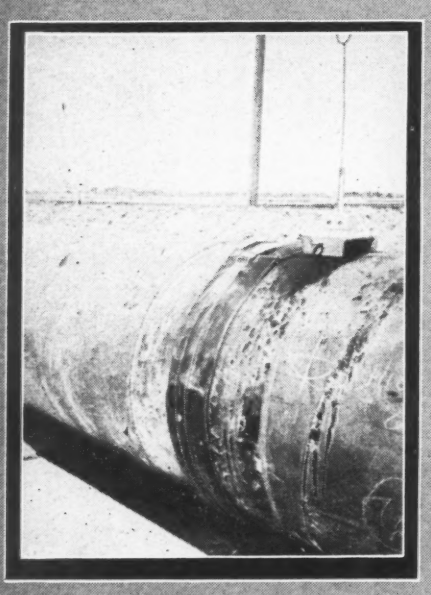


Fig. 4. Equipment used to insert and center radium capsule in line.

Fig. 5. Backfiller used to shade pipe after it has been lowered into the trench. This operation is performed in the early morning hours of the day following lowering.

this bead is about half completed the clamp is released and moved ahead to line up the next joint. The other two welders then start on this joint, the clamp being moved ahead when the bead is about half completed in order that the next joint may be lined up for welding by the first pair, who by this time have completed their joint and have "leap-frogged" the second pair. After completion, each stringer bead is cleaned and examined for burn-throughs, "frog eyes" or any other defects. All defects found are repaired by a stringer bead repair welder who preheats the weld and then makes the repair necessary. Occasionally a Gamma Ray photo is taken of a stringer bead. The weld is then completed by the "firing line" welders, who make the two additional passes.

All welders are tested before being put to work, the qualification tests being in accordance with those of the American Welding Society. In addition, Gamma Ray pictures are taken of each qualification test weld.

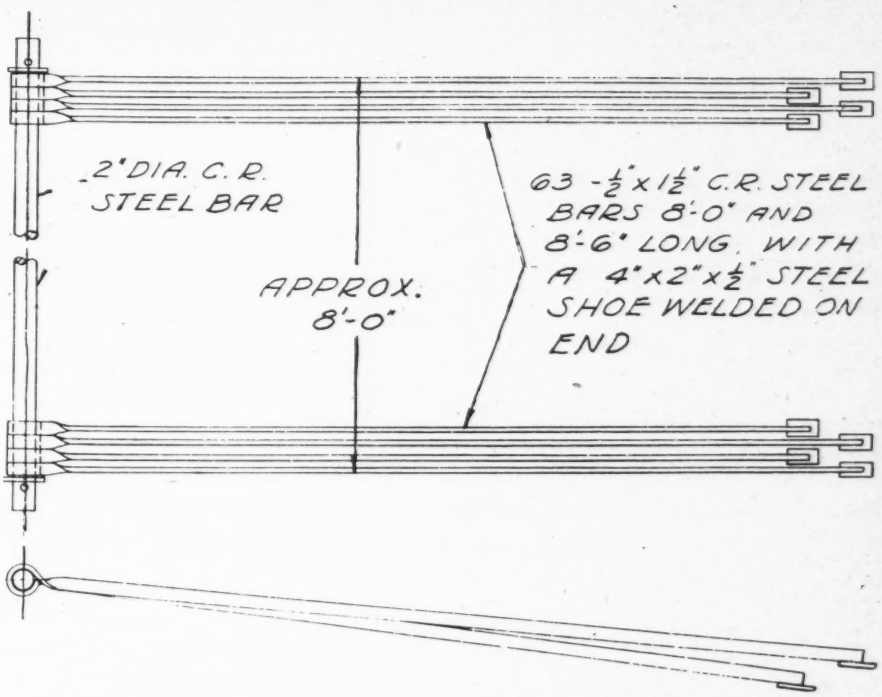


Fig. 7. Equipment devised to prevent damage to pipe coating when shading. Operating with backfiller, it segregates fine material from large chunks in the spoil bank.

Checking Welds

In planning the job, it was decided to Gamma Ray about 10% of the field welds, or at least one weld per welder per day. After the contract had been let, a set of "standards of acceptability" was prepared and agreed to by the contractor's welding engineer, the gas company's engineers, and the representatives of the company making the Gamma Ray pictures. These standards have proved entirely satisfactory, and the use of the Gamma Ray has received the full acceptance of the contractor and the welders themselves. At the start of the job a few welds were cut out to test our standards, but this practice has been discontinued since in all cases the interpretations made from the pictures were found to be correct. All films are available to the contractor and to his welders in order that they may see the defects which exist and thus disqualify the weld according to the standards. It is very seldom that a weld which fails to meet the standard is so poor that a few inches of repair will not bring it within the standard.

Fig. 4 shows the equipment used to insert and center the radium capsules in the line. The belt carrying the films shows clearly in the illustration. The films are each about 16 in. long and 6 in. wide and overlap each other slightly as they are fitted into the belt. The belt is centered over the weld and wrapped around the pipe. A set of lead numbers denoting inches is also wrapped around the pipe clockwise in the direction of laying opera-

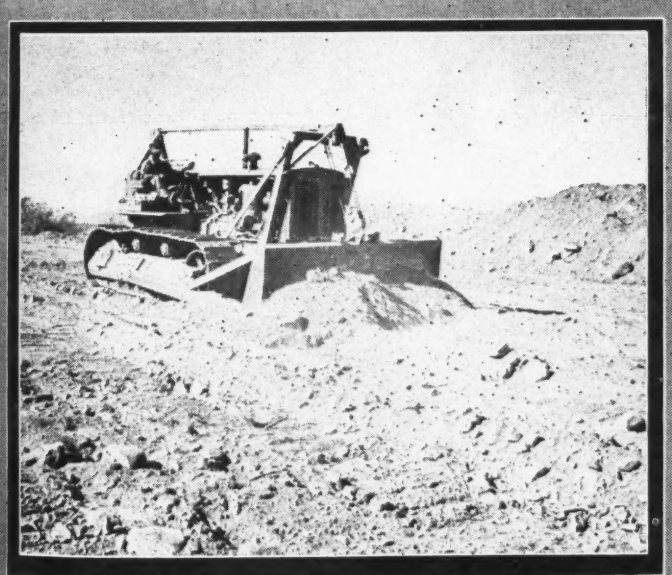


Fig. 6. Grading right of way. Much of the spoil bank, as shown, was too large for safe backfilling.

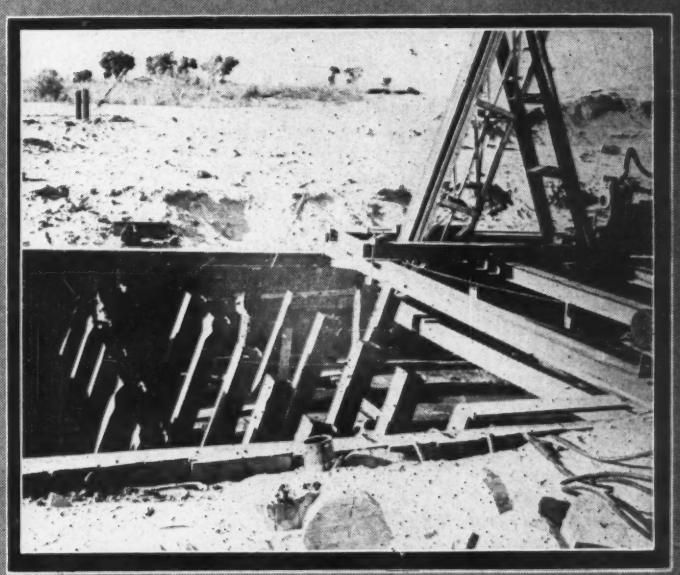


Fig. 8. Pilings shown before pouring the block in which the main cables and wind cables were anchored.

tions, with zero on the top center of the pipe. When the films are developed, the lead numbers show on the negative and defects are easily located by measuring from the top center of the pipe. The hole drilled in the pipe for inserting the capsule is a 1-in. hole spaced about 6 in. from the weld. This hole is repaired by welding a 1½-in. round patch stamped from 30-in. pipe of ⅜-in. wall thickness over the hole. The fillet welds used in making the repairs are three pass welds, and the pipe is slightly preheated before making the weld. A 400-mg. radium capsule is used for making the negative and the exposure time varies from 35 to 45 minutes, depending on the wall thickness of the pipe. It is possible to have a report on a weld within about 1½ hours after the weld is completed, and necessary repairs can then be made.

Bends and Angles

Bends made by the wrinkle method are being used for horizontal or vertical angles of less than 10° total deflection. At the start of the project, bends were made by the hot wrinkle method, but they are now being made with a cold wrinkle machine.

Angles of greater than 10° deflection are made by using sections of 30-in. weld ells, which are cut radially to give the desired angularity. Pups of line pipe are generally welded to the section of weld ell, by welding both inside and outside, and this unit is then welded into the line. This method of making angles has been found to be entirely satisfactory.

Backfill

After the pipe has been lowered into the trench it is shaded during the early morning hours of the following day. *Fig. 5* shows the backfiller used for this purpose. This equipment consists of a small tractor with a long side arm to which is attached a shallow scoop about 5 ft. long. The scoop, operated by one man, pulls the spoil from across the trench and at right angles to the trench, flowing the material over the pipe to a depth of about 10 in. After each scoopful the tractor is moved ahead by the other operator a distance of about 4 ft. This same equipment later completes the backfill, being followed by a bulldozer which dresses up the right of way.

In planning the job it was anticipated that about five miles of line would be in rock where there would be insufficient fine material available for padding the ditch and shading the pipe, and this condition was provided for in the specification. However, during right-of-way grading operations and later when the trench was excavated, we found that the desert surface conditions did not always exist at trench depth, and that our spoil bank was composed of material much too large to backfill safely onto the coated pipe. *Fig. 6* shows this material exposed while grading the right of way.

It was immediately realized that to prevent damage to the protective coating it would be necessary to devise some means of segregating the available fine material for use as shading over the pipe. The need was for something which would work with the backfiller and at the same rate, since the time available for shading operations was limited to the early morning hours.

Screening Spoil Bank

Fig. 7 shows a piece of equipment designed for this purpose which, while it is not perfect, has shown possibilities and under certain conditions is doing a very good job. It consists of an 8-ft. length of 2-in. pipe reinforced by a piece of railroad iron. Bars of cold rolled steel 1½ in. x ½ in. alternately 7 and 8 ft. long are looped around the 2-in. pipe. Each bar has a 1 in. x 2 in. shoe at the trailing end to give an upward lift as the bars are moved forward. Each bar is free to move vertically and independently of its neighbor, and due to the loose fit around the pipe and the normal flexing of the flat bar some lateral movement is obtained. The movement in either plane being least near the 2-in. pipe, the size of material which will be in contact with the pipe coating is controlled closely.

Although this equipment should be attached to the backfiller and moved by it, the present backfiller is already overloaded and unable to pull the added load. A separate tractor is used, its moves being coordinated with those of the backfiller. In operation the backfiller pulls the spoil on the grating and the towing tractor moves ahead about 4 to 5 ft., this movement tending to shake the finer material through the bars and onto the pipe, the coarser material sliding off the ends of the bars to the rear.

While the normal trench width is only 42 in. we have made this device 8 ft. wide, since invariably where its use will be required the material is of such a nature that the trench banks will not stand uniformly, and in many cases the trenching is done with back hoes. Where the trench width is 42 in. the outer two quarters of the bars lie flat on ground surface, and as the trench widens more bars become active in screening the material.

Canal Crossings

I HAVE mentioned that we have our share of railroad, highway and irrigation canal crossings to contend with in both divisions.

In the Palo Verde Valley, an agricultural area solely dependent upon irrigation canals for its water supply, we had more than our share when eight major canals, one railroad, and one highway had to be cased. It was necessary to install the 36-in. casings under the canals ahead of construction in January, because that month is the time of minimum water demand and is the only month in which the canals could be dried for open cutting. Due to the high water table, 4 to 5 ft. below ground, and the extremely fine river sand, it was impractical to attempt boring. The work had to be performed under a rigidly fixed time schedule with the constant threat that if something went wrong, that particular canal had to be put back in service on schedule without regard as to whether the job was complete or not, and no second attempt could be made until the following January.

Colorado River Crossing

At the Colorado River, the line will cross the channel on a suspension bridge with a span between towers of 1020 ft. and at a height above the river of about 40 ft. The bridge tower foundations consist of 11-ft. diameter caissons sunk to 56 ft. with 14 steel beams piling driven to firm footing below the caisson. On the Arizona side, rock was reached at 65 to 70 ft.; however, on the California side, a depth of 150 ft. below ground was necessary before a firm footing was reached.

In sinking the caissons, several large trees were encountered at about 35-ft. depth. These were cut outside the caissons with a special cutter driven by the pile driver. After cutting, the trees were brought to the surface through the caissons and found to be 18 and 20 in. in diameter.

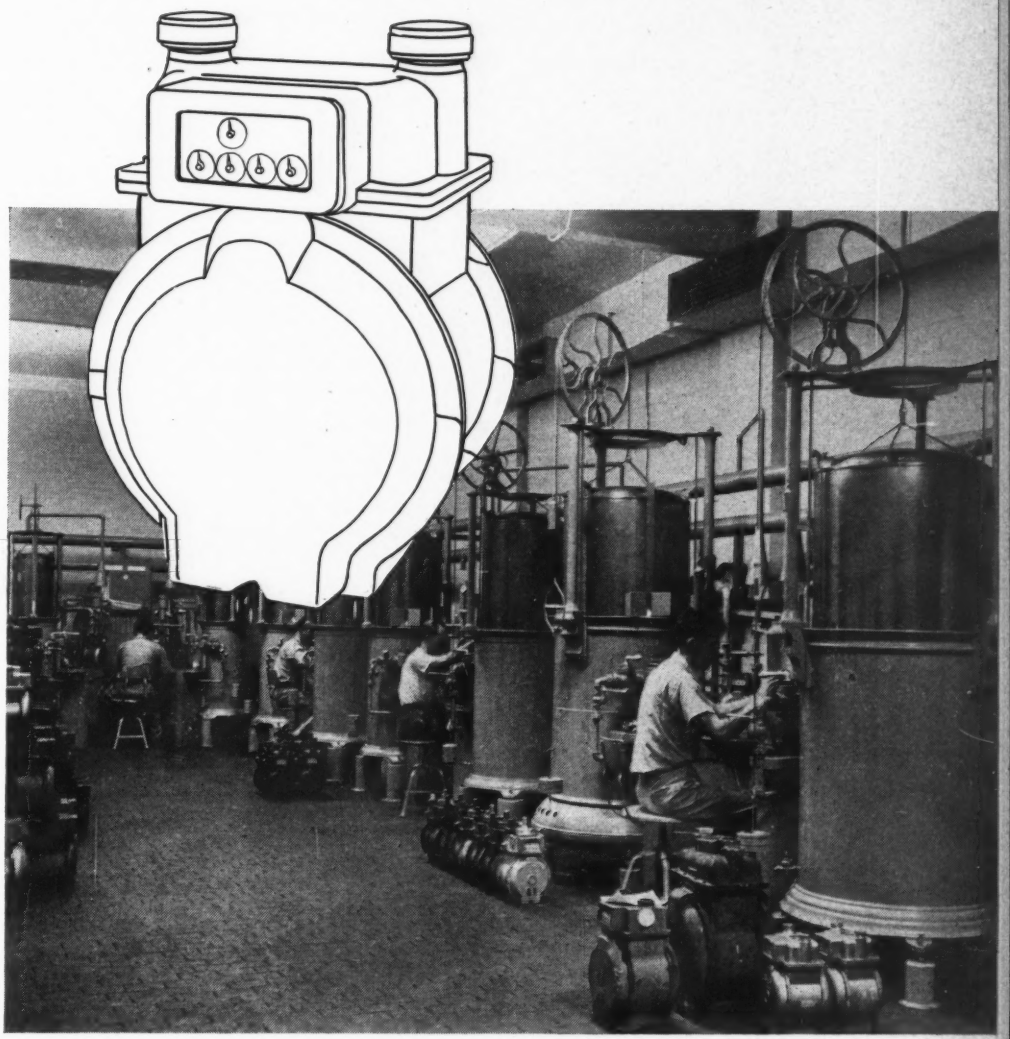
The main cables and wind cables are anchored in concrete blocks 40 ft. long by 20 ft. wide and 15 ft. deep. These blocks have 35 steel H beam piling driven on a 4-to-1 batter. *Fig. 8* shows the piling prior to pouring the block.

The pipe extends to just past the towers, and then turns at 90° and slightly down, a distance of 120 ft., where it is below ground level, again turning 90° to join the line. Insulating flanges will separate the line from the pipe in the bridge.

San Diego's Extraordinary Meter Repair Shop

By LAURAN CLAPP

San Diego Gas and Electric Co.
San Diego, Calif.



EMPLOYEES of the San Diego Gas and Electric Co. take particular pride in showing visitors through their gas meter shop. Not only does the shop embody many features which save considerable time and labor, but very nearly all of its automatic equipment used for repairing and rebuilding gas meters was designed and built *by the men themselves.*

Exclusive

The management has long held to the theory that by reducing the amount of physical labor involved in the job of testing and rebuilding meters, greater efficiency and better workmanship are bound to result.

The equipment designed and built for the shop is in itself both time- and labor-saving. Because of this equipment, there is less lifting, lowering, and handling of heavy gas meters.

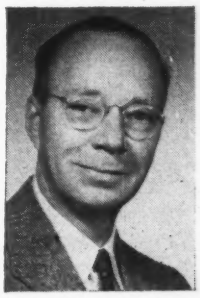
In the air-conditioned prover room the gas-meter provers are equipped with pneumatically operated connections, thus eliminating the time-consuming and tedious work with conventional union connections. In addition, the outlet connection is equipped with a calibrated valve which can be changed from open to check rate by merely repositioning the handle. The provers are also automatically filled, which circumvents the necessity of hand operation. The prover benches are designed to permit the operation of two provers by one operator with a minimum of effort.

Proving Large Meters

The picture illustrating the 100-cu. ft. prover shows the ease and simplicity with which large commercial and industrial gas meters are connected. Replacing the conventional flanges and bolts is a resilient rubber tubing which is rolled over the ends of the pipes. The main 8-in. valve has been removed, and a simple internal poppet-type valve has been installed in the well. The handle for its operation is shown at the right of the prover, just above the prover filling valve. This prover is also equipped with an automatic shut-off device to prevent overfilling.

In the foreground is shown the mechanical hoist which can be easily adjusted to any height necessary for the different sized meters tested. There is an automatic ratchet which grips the cylinder and prevents the hoist from coming down. At the end of the white line is a small button which must be depressed in order to release the ratchet and permit lowering of the lift. This safety feature would preclude an accident if the cable broke.

Following the prover room tests, which all meters receive upon their return from the field, 12 meters at a time are placed on a specially designed bench where index boxes and indexes are removed. An electric drill is used

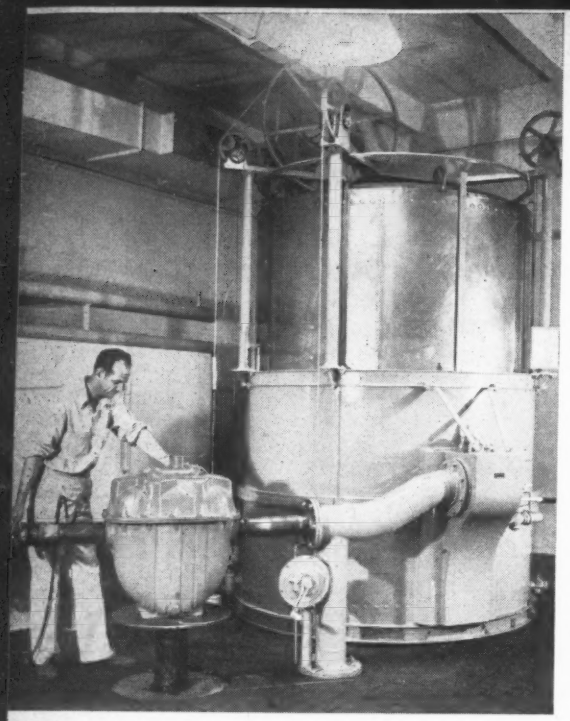


Charles Stewart

One reason why San Diego can boast one of the finest meter shops in the country is that most of its automatic equipment was designed and built by the men in the shop themselves. Another reason is Charles Stewart, its general foreman. A great believer in saving labor, speeding operations, and modernizing equipment, he has been instrumental in the construction of many of the ingenious devices in use there.

Stewart came to San Diego Gas & Electric Co. in 1921. He was connected with the meter shop continuously until 1944, when upon the death of Otto Goldkamp he was appointed foreman.

The shop has already won a great deal of recognition on the Pacific Coast.



Jim Joyce operates the 100-cu.-ft. prover used for testing industrial meters. Note manner in which meter is connected, and mechanical hoist for easy handling.

to clean the drain hole in the bottom of the index boxes, while electrically-driven screw drivers are used to remove the flange screws.

Grinding Valves

After the meters have been dismantled, the glass valves are reground on a special valve grinding machine which consists of a 20-in. rotating iron disc driven by a ½-hp. motor. Surrounding the disc is a thick rubber wall, several inches high. The centrifugal force of the disc throws the valves against the rubber sides and starts them spinning counter to the rotation of the disc. A fine grit, such as that used for grinding telescope and other types of lenses, plus a steady drip of water, provides the abrasive.

In this manner 8 to 10 valves are ground at one time. Some valves require only a half-minute of grinding, while others require several minutes or more, as in the case of badly worn valves. The valves are ground to check within five light bands of perfect flatness (approximately .000058 inch). When the surfaces of two such valves are slid together, one will suspend the other in mid-air, so perfect is the fit. Two ground valves, slightly moist and wrung together, will support a 6-lb. pull for over 18 hours.

A considerable amount of adjusting was required at first to regulate the speed of the disc in order that the action would not be too fast and the valves receive a convex shape. For valves that are seriously worn or contain deep abrasions, a floating spindle near the middle of the grinder is used to pre-form the heavier grinding work. One man can process a sufficient number of reground valves for normal meter shop production.

Pre-Shrunk Diaphragms

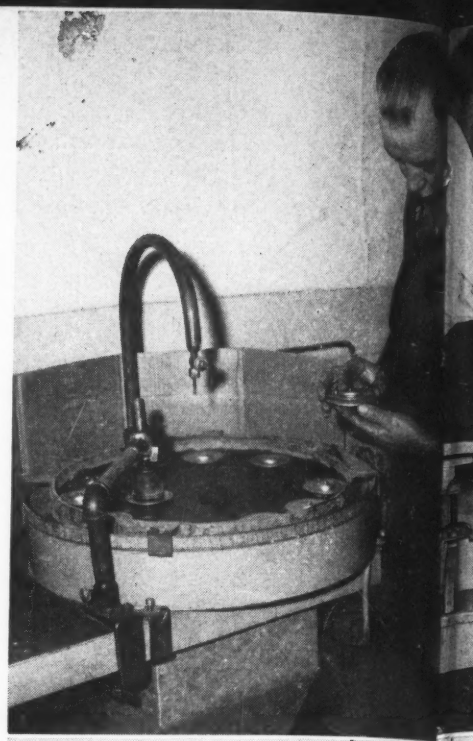
Diaphragm shrinkage during the meter's service is conducive to fast meter proof. It was reasoned that if the leathers could be pre-shrunk before they were placed in service, the probability of fast meter proof would be considerably reduced. For several years, research and experiments were conducted, and at last an ingenious machine was developed that automatically flanges and shrinks the diaphragms to a predetermined depth. This process also drives out the absorbed moisture of the untreated leather, and the leather is immediately immersed in a high-boiling point mineral oil at 115° F. and then hung on a rack to drain.

The top portion of this machine is movable and hydraulically operated. When the diaphragm has shrunk to a pre-determined depth, the top portion of the machine is automatically raised, the diaphragm is replaced, and the top portion repositioned. The machine is electrically heated, thermostatically controlled, and operated with air and electronics.

So satisfactory have been the results that "processed" diaphragms are not only exclusively used for replacements but are also specified for new meters, which are processed at the factory on a similar machine built to the San Diego company's specifications.

Cinching Screws

After the meters are cleaned and reassembled, they are sent to the screw-tightening machine where the screws are "cinched." This machine performs the job of holding the meter in any one of three desired positions and applies pressure on a ratchet-handled screw driver. The machine consists of a metal base which can be raised or lowered automatically to adjust the meter to any desired working height. A pneumatically-operated vise clamps

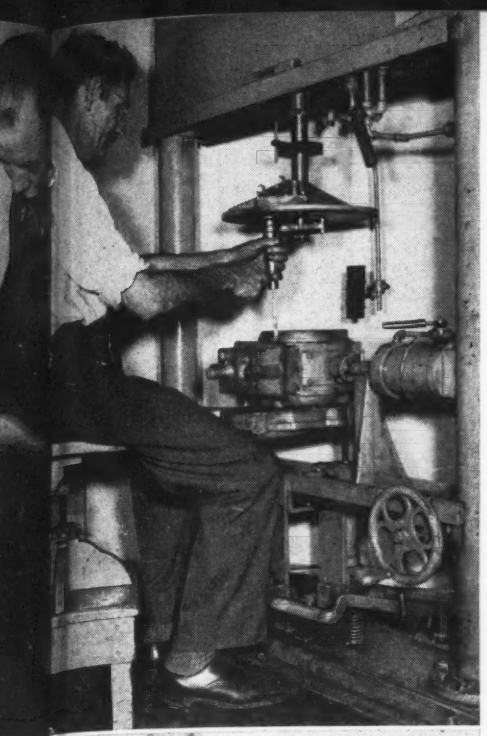


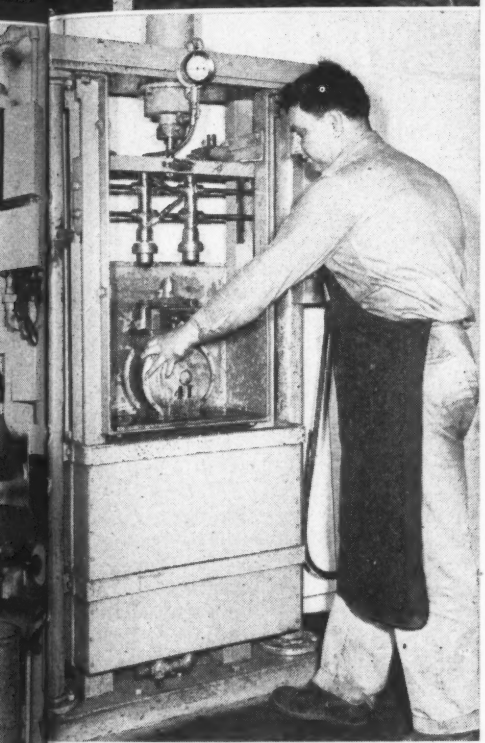
Top to bottom:

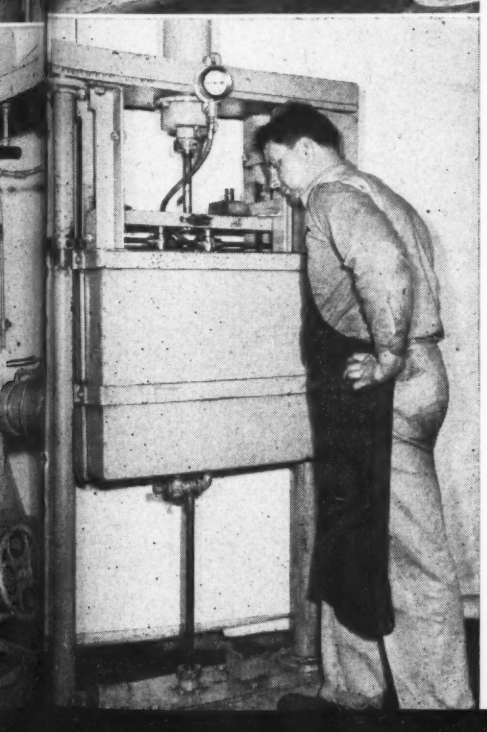
Glass valves are reground on a special valve grinding machine consisting of a 20-in. rotating iron disc driven by a motor. Operator Al Le Grand holds two of the valves together to illustrate smoothness.

Key Gravely gets ready to place a new leather diaphragm into the diaphragm flange ironer. Iron is raised or lowered by the lever at his immediate right.

Tightening screws on a meter with the screw-tightening machine. Pneumatic vise, operated by lever at right, holds meter in any one of three positions. Right foot pedal raises or lowers screw driver; left foot pedal raises or lowers base on which meter rests.







Top to bottom:

Screw tightening machine holds meter on its side. Mirror guides the operator, Sam Stark, in tightening bolts he cannot see.

Preparing for hydro test, Gene Rinner places meter on the platform; the air intake and outlet connections are raised or lowered into place pneumatically. Connections have rubber nipples to insure tight fit and avoid necessity of making mechanical union connection.

After the meter has been placed on platform, a touch of the lever brings the bath up and submerges the entire meter and platform. Operator looks for tell-tale air bubbles that reveal a leak.

the meter from the sides. This vise rotates on a horizontal axis, thus enabling the operator to turn the meter on its back, front, or top. A simple push of the foot pedal brings the metal base up to hold the meter steady.

A movable ratchet-handled screw driver is attached (through the medium of two links pinned concentric) to a flat metal disc that is raised or lowered from the top of the machine. The operator simply guides the screw driver into position, touches the foot pedal to lower the disc that applies pressure on the screw driver, and then turns the ratchet handle that tightens the screw. A small mirror enables the operator to guide the screw driver into place on the blind sides.

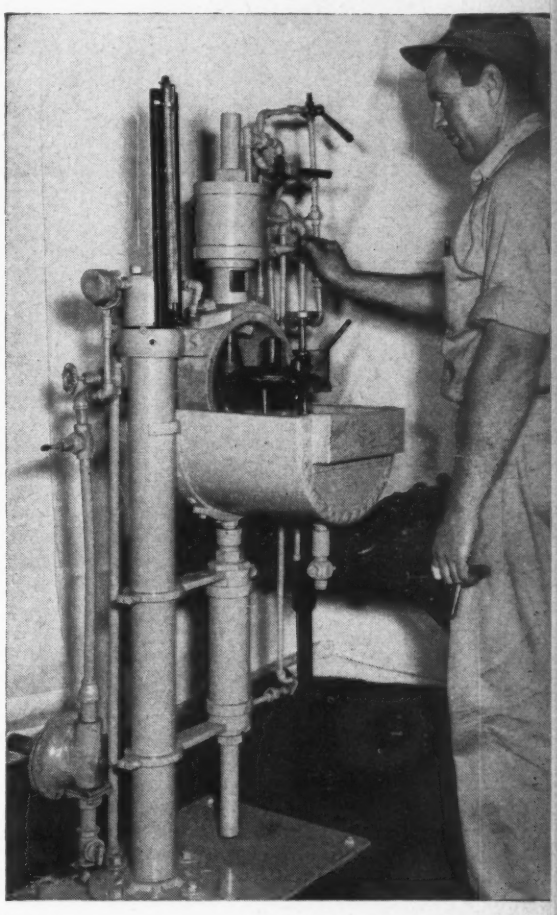
Pressure Test

After the meters are tightened they are tested at 5 psi (or 20 times working pressure). To avoid the necessity of connecting and disconnecting metal unions, the meter is placed on a metal platform and the intake and outlet pipes, which are equipped with thick rubber nipples, are pneumatically lowered over the meter connections. An automatic valve admits the air. To avoid the wasted effort of having to lower the meter into a water bath and then raise it again, the bath is raised by pneumatic pressure until the water completely submerges the meter. The tank in which the water is held is sufficiently large to surround completely the platform on which the meter rests.

Designed on the same principle is the service-regulator tester, in which regulators are subjected to an inlet pressure of 30 psi and then immersed in a water bath to check for possible leaks. Once the regulator is placed in position and the air intake and outlet pipes, equipped with rubber nipples, are clamped in place, the water bath is raised pneumatically, completely submerging the regulator. At this time the regulator is also tested for performance and lockup pressure.

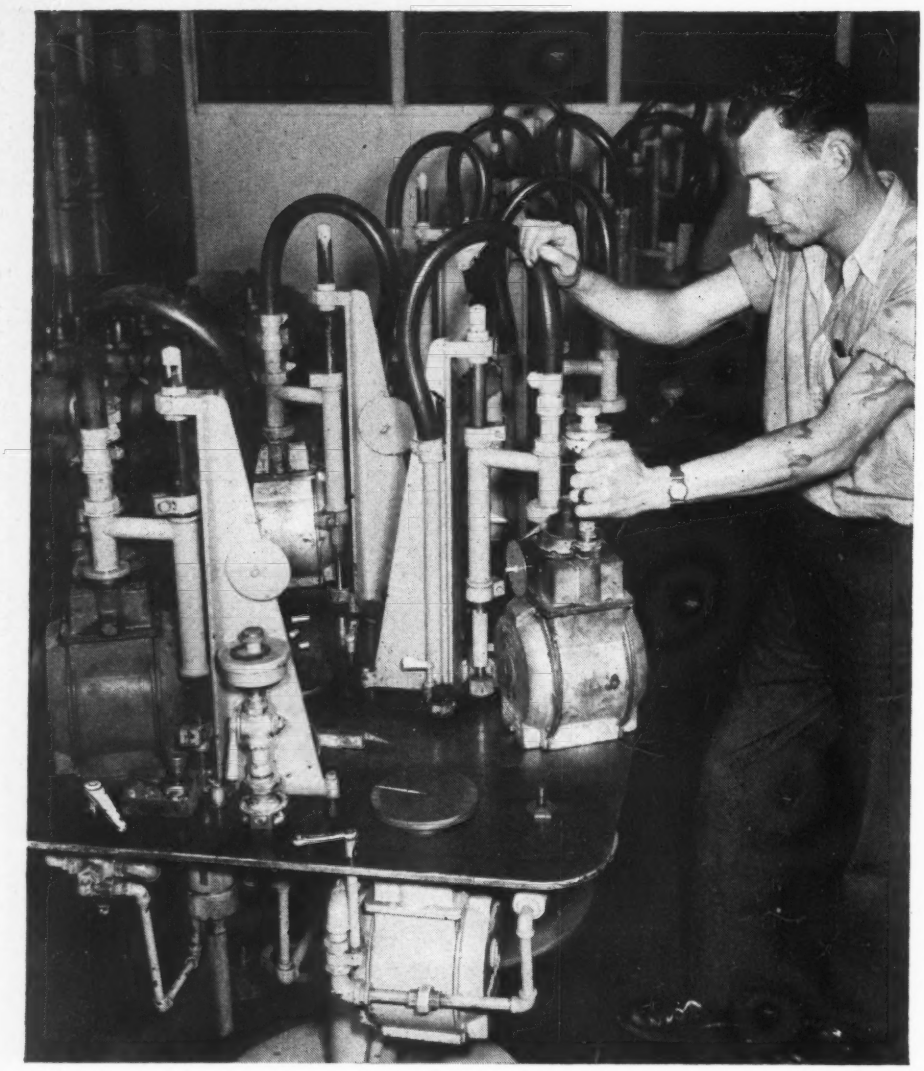
Breaking In

New meters and re-diaphragm-repaired meters are run from 8 to 12 hours at 190 cu. ft. per hour on a novel breaking-in bench. The theory is similar to the practice used for new cars, machinery, etc. In addition to reducing binds and bearing friction, the run pre-forms the characteristic folds in the diaphragms before the meter is finally adjusted prior to installation. Tests show that this is a distinct advantage. The company's two breaking-in benches are approximately 14 ft. x 4 ft. and will accommodate 64 meters each. Filtered air from the air-conditioned prover room is used, and the connectors are pneumatically operated. Each connection is equipped with an automatic valve that shuts off the air when the connection is raised.



Pressure regulator tester, designed on a similar principle to that of the meter hydro test. Operator Gene Lecoq raises and lowers the bath pneumatically.

Through research and statistics, the fact has been established that the average customer consumes gas at rates between .5 and 3 cu. ft. per hour for periods of approximately 20 hours per day. Therefore, it is essential that gas meters be accurate at these low rates of flow. The conventional method of checking meters at these rates nec-



Low rate test machine, operated by Jack Hill. The dial (shown in foreground on the table) shows the amount of gas passing through test meter below the bench, while the circular disc on the meter being tested is a temporary dial which can be slipped on and off and is built just for this test.

essitates connecting them either in series or parallel to a gas supply, purging them of air, and burning a small amount for a predetermined period equivalent to one or more revolutions of the meter. This is called a "small light" test and is practiced by most utilities.

Low Flow Test

Under the simple, quick, and accurate method used by the San Diego Gas and Electric Co., a meter is pneumatically connected in series with a test meter (mounted below the test bench), which registers on a large dial above the bench. It is only necessary to pass air through the two meters sufficient for one revolution and compare the difference on the test meter dial. If the tested meter is within 4% of accuracy on the open and check rate (.75 cu. ft. per hour) the meter is sent to the prover room to set overnight before final tests. With the above procedure, the testers not only determine whether or not the meter will operate at extremely low rates of flow, but they also determine the accuracy of such an operation in percentage. The simplicity of this process enables one man to operate several of these machines and test the entire shop production.

Because the average gas meter employed by the utility weighs approximately 35 lb., every thought has been given to eliminate excessive handling and transportation. For example, after the final test in the prover room, the meters are placed in chutes and are received at bench height in the paint room, where they are dipped in paint, drained, and placed on racks to dry. The meters are also handled at bench height at the screw-tightening machine. Light-weight roller bearing trucks are used for mass transportation. The shop benches are all steel construction, and the floor is wood block for comfort and elimination of noise.

SAFETY BRIEFS

1. Do not smoke inside the fenced enclosure of any compressor station or meter station, while working on any pipe line containing gas, or any pipe line which has been unloaded for repairs. Before starting work of this kind supervisors must see that all matches, lighters, etc., are collected from the men and removed to a place of safety.
2. Attend at least one safety meeting every three months regardless of assigned location on system.
3. Report all injuries, no matter how slight, immediately to supervisor for first aid; written record must be made of such treatment.
4. Never fill gasoline tank on any gasoline-driven equipment without first stopping motor.
5. Ground all portable electric hand tools before using.
6. Do not play, scuffle, etc., on job or on trucks going to and from jobs.
7. Wear goggles while grinding, chipping, breaking concrete, painting with primer or hot dope, helping welder, cleaning spark plugs, pouring molten lead or babbit, cutting pipe in bell hole or cleaning pipe. Study safe working practice for eye protection that applies to job.
8. Do not attempt adjustments to regulators, valves or other equipment unless authorized by supervisor.
9. Turn in all safety equipment, such as goggles, face shields, asbestos gloves, flashlights, etc., each night.
10. Do not use compressed air for cleaning clothing, nor direct the stream of compressed air at a fellow employee.
11. Do not get on or off any truck, tractor or other equipment while it is in motion.
12. Wear a life preserver, securely and properly fastened at all times, when engaged in work requiring the use of boats or barges.
13. In case of doubt as to proper method of continuing a certain piece of work or operation, consult supervisor.

—from The Southern Natural Gas Co., Birmingham, Ala.

COMMERCIAL COOKING:

An Evaluation of Current Trends A Forecast of the Future

By J. W. McNAIR
Standard Gas Equipment Corp.
Baltimore, Md.

THE AUTHOR DISCUSSES
- **Electronic Cooking**
- **Infra-Red Method**
- **Pre-Cooked Frozen Pie**
- **Packaged Meals**
- **Tomorrow's Kitchen**

MANY people expected that with the firing of the last gun on the Pacific front there would appear a bright new world filled to overflowing with startling new applications of science; that there would be new gadgets and instruments of living completely changing our way of life. This hasn't been so. True, our war-gained knowledge is already finding profitable application in the design and manufacture of many products. New products are gradually beginning to flow from the loading platforms of companies getting back into peacetime step after busy months of reconversion, material shortages, and work stoppages. Laboratories once again hum with activity that is meant to spell better and easier living rather than quicker and more certain death.

There is nothing frightening about it. We have had and, I can assure you, may continue to anticipate a steady stream of improved materials and equipment. The thing that has been misleading in publicity and advance advertising has been the implication that all these things will be available "any day now." It just isn't so. A long time will elapse before industry will be ready for many of these new developments. And we may expect new ideas, new faces, and new products in the commercial cooking field.

Electronic Cooking

A most dramatic departure from the usual in food preparation is the appearance of an electronic cooking device that is expected to accomplish in seconds, by induction heating, what would require many minutes of heat application from conventional fuels. We have examined this device, and while aware of its ultimate potential, we feel that the day is somewhat removed when food preparation by this method will occupy more than a minor role in but a few commercial kitchens.

Impractical Now

The principle of induction cooking has long been known and much money has been poured into laboratories' efforts to perfect if for general use. One major company announced some time ago that it had thoroughly explored the field and was dropping its research program. Another large company actually produced a domestic range operating on the same principle, but revealed at the time of unveiling this range that from the standpoint of initial cost and operating charges, the range was as yet not practical.

The device now being presented to the commercial trade will cook, but it is an electrical device which is something like 30% efficient at making heat available to the product being cooked. In addition to the electric bill the user must foot, he must also bear the tariffs of large amounts of cooling water constantly required during operation. Maybe he could use that water for washing dishes. While the induction method prepares food that is well cooked and palatable, it does not impart the desired outside color to steaks, chops, and chickens, which we are accustomed to associate with well-prepared dishes. To overcome this disadvantage the maker is proposing to use a conventional-type broiler for coloring purposes.

Infra-Red

Before we finish our scrutiny of the radical departures in methods of cooking foods, let us make brief mention of another method on which experimenters have been working for some time, but of which we have heard little in the past two or three years: cooking by infra-red heat. While steaks have been prepared successfully by this method, the principal applications resulting from the research seem to be in the fields of fruit and vegetable dehydration and quick paint drying.

Laboratory men offer the opinion that cooking by infra-red rays offers some of the identical disadvantages of electronic induction methods. Principally, they point out, while speedy operations can result, the penetrating infra-red rays cook from the inside out and there is the loss of the appetizing exterior color. There is some surface heat given off by the special bulbs, along with the shorter rays, but it is felt that not enough coloring action is obtained to eliminate the necessity for a second finishing operation.

Lamp As Griddle

One variation of this method which I have seen tried was to use the lamp itself as a griddle plate. But—the lamp broke. If someone can make a lamp that won't break, they will have something.

Advocates of this system claim it is an ideal application for meal service on trains and planes. The system is also said to be adaptable to in-plant feeding, hospital service, and the like. One large department store in New York City recently advertised that it's customers could purchase complete pre-cooked and frozen meals which they could take home for domestic use.

Recently in Chicago I ate a delicious cherry pie which was rich, had a flaky crust like home-made pie crust, and with the richest, tangy, juicy cherry filling than anyone could wish. This pie is made in a commercial bakery under a formula which, it is said, is too rich for pie handled like ordinary bakery pies. It is then frozen and is distributed to retail stores or restaurants. It may be put back in the oven while hard as a stone or may be held for up to 20 hours after being thawed,

Presented at the Southern Gas Association Convention, Biloxi, Miss., April 16-18.

before it is baked. Just think what this can mean to a restaurant in the way of serving hot pie, and how easy it would be to meet the emergency of the unexpected rush of business. This plan will throw a heavier load on the restaurant kitchen and in many places will mean that new equipment must be obtained. I am told this same plan is in operation in other cities.

We feel that restaurants and other commercial and institutional kitchens, though little affected by the introduction of the pre-cooked and frozen food system up to this time, may some day have to change their thinking. It is our business to be aware of what is going on and to be in a position, when the time comes, to furnish the necessary advice, equipment and gas fuel. Our motto should be: if its better and it will cook—we'll cook it.

Packaged Meals

Another system of packaged precooked meals which has attracted wide attention since its development and introduction a short time ago bears close scrutiny by our industry. This system is well named—"Meal Pack"—which is what it really is—an insulated package containing hot cooked food. This plan has the advantage of eliminating many costs inherent in some other systems, yet adds only the depreciation on the insulated container. There should be a future for this plan in in-plant feeding, and in hospital, plane and train food service.

The first important point is that the plan envisions the establishment of large central commissaries. This means equipment and a heat source must be bought, and, of course, the heat should come from gas. Properly chosen and installed modern gas-fired equipment can do the job best.

How They Work

The meal is placed in a heavy Pyrex glass dish, which has been preheated to about 200°F. This dish has three partitions, as in the blue plate dish, and is built so that an aluminum faced cardboard lid can be pressed into the top with the foil face down. This lid goes into the dish in the same fashion as an old-fashioned milk bottle top. The slight cooling of the air in the dish, which takes place immediately, sets up a partial vacuum which seals the lid against the partitions. The foods and their odors are forever kept separate. Buttered rolls, pie wrapped in aluminum foil, cutlery, napkin, or, if desired, a dish of soup in place of the pie, are placed atop the dish and the whole placed inside an insulated stainless steel container. When locked the container looks very like two pans locked, open sides together.

The reservoir of heat in the Pyrex dish is conserved by the insulation so that foods measure 148°F. after three hours. It is amazing how palatable these foods are after long hours in the container. Even vegetables do not deteriorate as they do when stored where more heat is constantly added. For storing longer than three hours ovens are provided.

The sponsors of this development have made a complete line of handling equipment for packing the meals, handling the containers, and rushing them to destination. The plan has been tried in hospitals, industrial plants, airlines, and for home delivery. It is now beyond the experimental stage in a number of locations.

Good Equipment Needed

The first consideration still seems to be good, practical, fundamental kitchen equipment, able to do the work for which it was designed and do that job day in and day out with the least amount of interruption. Important also in planning for the future is the ability to maintain clean and sanitary conditions in the equipment itself. And planners are not satisfied with equipment in its present form.

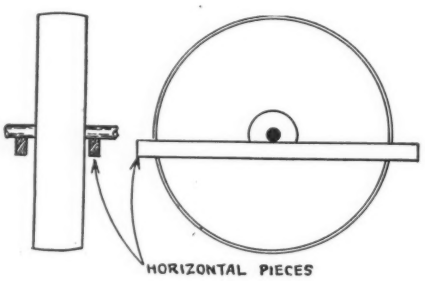
There is a considerable group of restaurant operators who are of the opinion that the kitchen of tomorrow will be of the open type, where cooking will be done in full view of the customers. Restaurant men generally believe that this will enable them to do a better job of food merchandising. Such a trend will require more attractive kitchen equipment, better design, more elaborate use of stainless steel, the use of new bright metals, sanitary design, and generally, more "sex appeal" in the equipment.

"Ni-Resist"

Another improvement now available on almost all commercial cooking equipment is "Ni-Resist." This material is much longer lasting, is warp-resistant, and prolongs the efficiency of equipment.

AN OPERATING KINK

BALANCING ROTATING MEMBERS SUCH AS SHEAVES, gears, sprockets, pulleys, etc., can usually be accomplished with sufficient accuracy by placing the member on a shaft that fits perfectly and then resting the shaft between two smooth and horizontal supports, as shown in the accompanying sketch. A device of this type is practically frictionless, and the member will roll back and forth until the heavy side is at the bottom. Of course, if the member is in perfect balance, it will not roll.



PROCEDURE: After locating the heavy side of a pulley, for example, it is evident that the pulley can eventually be made to balance in every position, without rolling, by removing weight from the heavy side. If this is impracticable, it will be necessary to add weight to the light side. First, determine the approximate amount of weight to be added by placing lumps of putty on the light side and experimenting for balance until the proper amount of putty is stuck to the light side.

After removing and weighing the putty, the correct amount of metallic weight to be added may be closely ascertained. Because of the difference in density of putty and iron it will not be absolutely correct, but usually it is close enough for practical purposes.

The metal, of course, should be attached in the location from which the putty was removed. If the metal is to be fastened into position by screwing, it is a good plan first to tap out and thread the hole and insert the screw which is to be used for fastening the metal piece in place. Then experiment with the putty.

Another method of attaining perfect balance is to apply putty so that the slugs bolted to the pulley on the light side will make that side slightly heavier than the other side. Then, to make it balance, drill or grind away sufficient metal to obtain a true balance. In this way the strength of the pulley will not be impaired by excessive drilling or cutting.

Reducing LABOR TURNOVER

By O. C. COOL

Director, Labor Relations Institute, New York

Exclusive

A leading personnel problem throughout industry today is that of employee turnover. The national average, according to the Bureau of Labor Statistics, covering the first 10 months of 1946, is approximately 6.5%. Five times as many workers leave of their own accord in a given period as are laid off or discharged.

Vexatious as this problem is to the individual employer, it can be solved through tested labor relations methods, based on long and varied experience during the war years, when turnover and absenteeism were monumental difficulties. Fortunately for the employer today, there are no abnormalities like manpower controls or wage stabilization to warp his approach to the problem. The avenues to stable employment lead directly to the goal. Avenue "A" is the familiar, but sometimes overlooked, broad highway of building better morale. Avenue "B" is the selection and recruitment of better-grade employees to fill vacancies as fast as these occur. All other approaches are only variants of these two.

"Building better morale" is really just another way of expressing "employee contentment on the job." If the quit rate in your plant exceeds that of other employers in your area, you may safely conclude, that morale among your workers is unnecessarily low, and that steps should be taken immediately to correct the situation. Certain of these, as will be explained hereafter, are generally applicable to any plant. Others which may need to be invoked may arise out of special conditions—such as unpleasant group relations in a particular department; a "hard-boiled" supervisor or one who plays favorites; or misunderstandings in regard to computation of pay, etc. These must be brought to light through special effort and separately dealt with. Other things being equal, however, every effort to improve morale reduces turnover.

Why Employees Quit

"First get the facts!" is a common-sense reminder to the employer whose payroll turnover is excessively high. Time and money can be spent to no avail correcting conditions that mean little or nothing to the workers who feel dissatisfied. If employees are resentful because some rule they deem inequitable is being enforced, physical improvements in the plant won't overcome the difficulty. The cheapest—and best—solution is to change or revoke the rule. In most cases, the employee who wants to leave is "fed up" with something. The important thing is to find out, and correct, the cause of his grievance. The best way to do this is through the exit interview.

This simple device, which won its spurs in the earliest days of the war, works this way: before a quitting employee receives his final pay envelope, he or she is required to report to the personnel manager or some other designated executive. A friendly conversation follows, during which the interviewer tries to analyze the reasons for the worker's dissatisfaction. Here are some of the things that exit interviews frequently disclose:

1. Hidden resentment toward the company and its policies.
2. The lure of better working conditions or wages in neighboring factories or plants.
3. Discrimination—real or fancied—in the awarding of increases, promotions or other benefits, or in the assignment of work.
4. Restlessness and a craving for change. This condition is extremely prevalent today, especially in centers where housing and other living conditions prevent workers from "growing roots" in the community.

During the years that they have grappled with this problem, the field service engineers of the Labor Relations Institute have perfected a list of questions which are most productive in bringing such matters to light. They are not to be used in a mechanical way, but should be asked informally and in a friendly manner by the interviewer—who *should not take notes* or check off the answers in the employee's presence. The interviewer should rely on his memory in filling out a complete report after the interview is over. The questions follow:

1. What seems to be the trouble?
2. Is it a matter of money?
3. Did you like your job?
4. Was it too hard for you?
5. Did you get along with your foreman?
6. Do you know what you are sacrificing in the way of promotion, advancement to a higher rate or other advantage by taking this step?
7. What incentives does your *new* job offer?
8. Have you any complaints about working conditions?
9. Do other workers in your department, or elsewhere in the plant, feel the way you do?
10. What do you think the company could do to improve conditions?
11. What can we do to fix things up for you?

Experience proves that, if conducted along such lines, the exit interview often results in the worker's going back to his job, or in remaining with the company in some alternative capacity. More important still, these questions bring to light the major reasons why employees are thinking of taking jobs with other firms. Once these are known, correction is merely a matter of treatment.

Road to Better Conditions

Here are seven basic factors which combine to make working conditions "good" in the eyes of employees. Incidentally, all of them are so important individually that it is impossible to array them according to any scheme of essentiality.

1. Job Security. No worker can feel really content, or do his best work, if he feels insecure on the job. Fear is the greatest breeder of discontent, and the fear of losing one's income—and the consequent loss in money to dependents, and of "face" to the job-loser—is the most deep-seated worry of all. Next to unemployment, the worker's greatest worry is over losses due to lay-offs, illness or other enforced idleness. Hence the value of security programs, including sick-leave benefits, hospitalization, paid vacations during seasonal slowdowns, and so forth.

2. A friendly atmosphere. Many employers only think they have succeeded in creating the kind of harmony that counts. Adherents of the "one big family" school, they gaze through rose-colored glasses at the men and women who tend the machines and staff the front office. "My door is always open. Anyone who wishes to can always see me personally," they say. In short, the only way to complain is to gripe to the boss—and if *he* hears no complaints, then there must be none. This viewpoint overlooks the fact that employees' relations with *other employees* are a vital factor in the content or discontent of the workers, and that "management" usually means the people with whom the employees come in contact, such as foremen, department heads and other executives beneath the top-management level. The sum total of their attitudes determines the friendliness of the shop.

Management cannot order employees and sub-executives to be friendly. However, it *can* set a friendly example by its daily dealings with employees, and by taking advantage of every reasonable opportunity to participate in parties, celebrations, outings and other similar occasions.

3. Formalized grievance machinery. The sooner a grievance is staged and settled, the better for all concerned. Hence the value of an automatic, impersonal system, in which the foreman or supervisor deals directly with the worker, but with the latter privileged to request an immediate appeal to some higher executive. Nothing causes worker frustration more than the feeling, "No use telling the foreman. *He* won't do anything about it!" By actual test, foremen like a formalized system as well as the workers do; the appeal machinery, if rightly handled, keeps them off the "spot."

Where formalized grievance machinery exists, and is *used*, many of the causes of employee "quits" are eliminated before they make serious trouble. But sometimes it is necessary to *teach* employees how to file a grievance, and how to use the system to air their difficulties. Don't let your grievance machinery rust away for lack of use; corrosion will cause trouble—and cost money—in the end.

4. Capable supervision. The foreman's job is growing bigger every day in the minds of progressive managers. There has been a general ending to the steady whittling down of authority and privileges which took place in recent years. The trend is now the other way; personnel departments are being reduced and decentralized, and the foremen in many plants are doing the actual hiring and firing and assignment of work. At the same time, the foreman's human-relations responsibilities have been recognized and increased, and he is held accountable in many companies for the consistent progress of the employees under merit rating and advancement schedules. He also participates in cost-reduction and productivity bonuses, and gets some of the credit when a subordinate wins an award for some money-saving suggestion. "Holding down" the foremen is another way of holding back employees, and should be avoided at all times.

5. Good housekeeping and safety. These two go together. A clean, neat, orderly plant is a safe and pleasant place in which to work. Light, heat, ventilation, noise proofing and other related conditions should be the best obtainable, because cleanliness and safety contribute to good employee morale.

6. Rest periods and relief. Cutting down the frequency and duration of morning and afternoon rest periods, and economizing on relief personnel, are two of the most conspicuous ways of being inconsiderate to employees. In plants where production pace is geared inevitably to automatic machinery, there should be adequate provision for relief and relaxation. To proceed in any other way is to classify the employee himself as a machine—and this is the opposite of good industrial relations.

7. Scientific determination of wage rates. There is no substitute for such scientific methods as job evaluation, merit rating, proper wage incentives and other instruments for equitable determination of what an employee should earn. Following the right systems is not enough; the employee should understand them as well as the experts. The employee who wonders if he is fairly paid, and if someone else receives more than he for performing the same work, is bound to suffer a set-back in morale.

Building for the Future

So much for the typical employee's attitude about his *present* status. Let us go further, and consider his position in the future. *He* does—more frequently than some "experts" give him credit for doing! It may well be that giving the workers something to work toward will correct the situation.

Employees feel that they are building for the future when the following policies obtain:

1. Length-of-service premiums, including increases based on years of employment; awards and gifts in connection with attaining membership in Ten-Year clubs, Quarter-Century clubs, etc.; vacations geared in length to number of years' service, etc.

2. In-plant promotion and training. Wherever possible, promotion should be from within the plant or department, and this policy should be backed with adequate training and preparation for advancement. Foremen should be encouraged to train subordinates to "carry on" for them when they are advanced or retired. Opportunity for advancement is something every worth while worker demands; management should help him rise as fast as he can.

3. Retirement plans and pensions. Most employees realize that Social Security pensions, unsupplemented, will not be enough to support them when they grow old. At the same time, current high costs of living and high income taxes make it increasingly difficult to save. The President's Council of Economic Advisors has confirmed the fact that 29% of all families have $500 or less in the form of savings. Hence the enormous morale value of a company pension plan, which has the further effect of discouraging voluntary withdrawals, since the latter frequently involve sacrificing accumulated benefits.

The employer must also look toward the future, especially when recruiting new workers. *Better selection of applicants* is one key to reduced turnover later on. The favoring of applicants who are permanently settled in the community, as above those who are still shifting from place to place, is one way to save money on replacements. Many companies have found it economical and mutually satisfactory to secure new workers through their friends, neighbors and acquaintances already working in the plant. This helps to build congeniality, and gives the workers a chance to help their friends "get located." The result is better teamwork, experience reveals.

Proper utilization of manpower goes hand-in-hand with selection. If the foreman has the final say in hiring and in assigning work, there will be fewer "square pegs in round holes" than would otherwise be the case.

It is important to remember that turnover is not an isolated phenomenon, confined to any small segment of industry. It is widespread and general, and is part of the larger reconversion problem. Through employee turnover, and the added financial burden it is causing, we are paying the price of the wartime conversion. But like every other price, it can be reduced in individual operations. That can be done by building employee morale and planning for the future.

LIQUEFIED PETROLEUM GAS

—Ally of The Gas Industry

LP-gas aids utilities in a number of ways—in peak load shave, in cold enriching and reforming, in reserving customers beyond the mains for future expansion. Mr. Cook reviews these, and proves its economic advantages.

By MARSHALL COOK

Phillips Petroleum Co.
Bartlesville, Okla.

THE gas industry in many localities has found itself in the position where it has almost been forced to accept seasonal gas loads. This is true not only with utilities distributing manufactured gas, but also those distributing mixed manufactured and natural, and straight natural gas, and is due, mainly, to the constantly increasing demand for gas for space-heating— and, in particular, house heating. It is a situation that must be met and solved in order to assure the gas industry of its continued growth and competitive position. In many cases it is necessary to connect these loads which give a poor load factor in order to hold the ones that are desirable.

Expensive Loads

In the case of manufactured gas, generally the existing plant facilities are not adequate to handle extreme seasonal peak demand, and natural gas utilities either find themselves unable to obtain the desired quantities or are faced with heavy demand charges which boost the cost of gas so high for the entire year that they are less competitive with other fuels. Consequently, then, some other means must be provided to make up this seasonal deficiency. The investment per therm must not only be much less than that of the usual manufactured gas equipment (such as water gas or oil gas), but the facilities must also be entirely dependable, and ready to start production almost at the touch of a button. It must also require a minimum of trained personnel to operate, and the resultant gas must be such that it can be mixed to the desired extent with the base gas and result in a minimum of service complaints. LP-gas answers those requirements in most cases.

Now let us examine the economics of an average LP-gas plant, installed for the specific purpose of peak shaving. This may be applied not only to the plant distributing manufactured gas, or a new natural gas distribution system, but also to the system converted from manufactured to natural gas. In the latter case utilities generally maintain their former manufactured gas equipment so as to make high-Btu gas for peak shaving and standby.

Adequate Storage

First, if LP-gas is being studied, the installation of adequate storage is vital. Generally, it is desirable to be able to store the amount required for approximately a 30-day period of usage, (more depending on circumstances) when deliveries of fuel are taken on a uniform year-round basis. In such instances, shipments can be scheduled so that the supply can be augmented at the monthly rate throughout the necessary period of withdrawal. As an example, consider the following experience of a prominent Mid-Western utility company:

This company has an installed net storage of 600,000 gal. of LP-gas. This amount of product, plus the regular shipments during the year, is calculated to handle peak shaving requirements for a 120-day period beginning Dec. 1, at which time the storage is full. By the end of the 120-day period, all 600,000 gal. plus the regular winter shipments have been used. During the next eight months no withdrawals are made, and the storage is filled at the rate of approximately 75,000 gal. per month. When the next Dec. 1 arrives, 600,000 gal. are available, plus 75,000 gal. per month for four months making a total of 900,000 gal. available for the season. This method is desirable in that it assures the utility of some fuel over and above its storage capacity, at a time when it is most needed.

If LP-gas purchases are made only on a spot basis, it is then necessary to have sufficient storage to carry the plant through the entire peak season, since most LP-gas marketers also have peak winter demands and transportation facilities are materially slowed down in the winter months. Since these gases can be stored indefinitely and at a relatively low cost per therm compared with the storage of gas in holders, their value as a raw material is enhanced for utilities having a poor load factor.

Much emphasis must be placed on the necessity for ample liquid storage capacity geared to plant requirements. A peak shaving LP-gas installation without such storage will be of little value in an emergency.

Must Act Now

Too many times during the past few years utilities have depended upon the producers or marketers of LP-gases and their transportation facilities to keep them supplied during critical winter months. There have been times in years past when there was sufficient LP-gas and transportation facilities to handle some of these utility winter peak loads; but such is not the case at present. Therefore, utilities having these winter peak load shaving requirements now should install sufficient storage so that they can at least take uniform deliveries throughout the year; or, better still, enough storage to tide them over the entire peak season.

AN LP-gas standby plant requiring, for example, 15 days of peak load gas may be installed completely for approximately $60 and on up per Mcf of daily make, depending on the auxiliary equipment requirements of the plant. This compares to an estimated cost of carburetted water gas or oil gas plants at approximately $200 per Mcf of daily capacity. The considerable difference between the original investment required, coupled

Presented at annual convention of Mid-West Gas Association, Omaha, Neb., April 7.

with the additional advantage of low labor and maintenance charges, give the LP-gas installation a most decided advantage.

Also, the LP-gas plant may be idle for a considerable portion of the year, during which time a minimum of maintenance and attention is required. One trained man only is required to unload tank cars and make minor changes or repairs that may be necessary. He may also put it into operation at infrequent intervals for tests.

Manufactured Plant Needs

On the other hand, water gas or oil gas plants require a well trained operating crew of men to be available on short notice. Those plants must be continuously maintained and cannot be put into operation in less than 24 hours.

Even though a utility has converted entirely to natural gas, it may maintain the manufactured gas equipment so as to be available for emergency use. Since greatly increased sales, despite an almost double Btu value, are generally experienced after such conversion, plant changes and additions to handle the increased load may require an investment of approximately $125 per Mcf of daily make. This fact, coupled with the necessity for considerable maintenance on the manufactured gas equipment and for experienced operating crews, can easily make the cost of such an addition to plant facilities prohibitive or most undesirable.

On the other hand, LP-gas air plants can be completely automatic, ready to cut in at a predetermined point based either on the amount of storage of the base gas or on the distribution pressures.

In many instances made-gas storage facilities have not kept pace with the growth of the utility, and once-adequate storage has dwindled to a small fraction of the send-out, sometimes necessitating the addition of supplementary gas in an hour or two. One 25,000-gal. tank of propane contains approximately 22,950 therms or the equivalent of a 2,295,000 cu. ft. holder of 1000-Btu gas—or a 4,365,000 cu. ft. holder of 525-Btu gas. The original LP-gas storage costs are as low as 3% of made-gas storage costs.

Percentage Costs

Let's look at this another way. In a number of cases, the amount of supplementary gas (utility gas plus LP-gas) required on a given peak day may be as high as 33 1/3% above the average daily send-out. In many cases LP-gas is called on to provide one-sixth of this peak send-out. Assume that this demand was to be required for 15 days during the season, and that the average daily send-out during the year was 75% of the peak. As an example, based on a peak day of 5000 Mcf, 12,500 Mcf would be required annually. Annual send-out would be $.75 \times 5000 \times 365 = 1{,}368{,}750$ Mcf. The percentage of LP-gas used would then be $\frac{12{,}500}{138750} = 0.918\%$ of the annual sendout. Manufacturing gas facilities may cost approximately $2 million for this additional load while LP-gas facilities would cost approximately $60,000 or 3%. The high cost would be prohibitive for the 0.918%, or approximately 1%, load it would assume. Water gas substitution may be slightly less expensive from a straight "holder cost" standpoint, but when one takes into account the interest, depreciation and maintenance expenses, the seeming advantages quickly disappear. Many who have converted their plants to natural gas will say that they already have the manufacturing gas plant investment, so why consider additional fixed charges, or capital investment. However, interest and depreciation charges are ever present and must be carried on the books.

If it was maintained as standby, the charges of course would be against the gas making operations. This would then require fixed expenses chargeable directly to the peak-shave gas. For the investment required then, it can be seen that this operation would make a high load factor of base gas quite profitable. It may, in some smaller operations, mean the difference between a substantial profit or a loss.

Even though the cost of LP-gas may be higher on a Btu basis, into the distribution system, the small capital charge will more than offset the higher material costs and necessary labor costs for manufactured gas equipment. Of course, each utility's problems must be analyzed individually to determine if there are possible savings by the utilization of LP-gas.

ANOTHER interesting application is the addition of LP-gas air to feed back from the ends of a distribution system. This can be easily set up to add a variable amount of augmenting gas which can be determined by the Btu value and gravity of the base gas, and is valuable when a distribution system is undersize. By this method, a considerable load that otherwise would require major overhauling of a distribution system so as to allow additional load building can be added at a point.

Cold Enriching

Nor does the above exhaust the applications of LP-gas in a manufactured gas utility. In some instances in use today, it has been proved that cold enriching or reforming has greatly added to the plant capacity. In cold enrichment, the thermal value of the manufactured gas, either water or coal gas, is usually reduced, but the quantity of made-gas increased with the thermal deficiency made up by introducing LP vapors at the outlet of the purifiers, or in the washbox of the water gas machines. LP-gas plants installed for this purpose are quite simple and generally require a minimum of equipment. Aside from adequate storage, vaporization, regulation and metering equipment is all that is needed. Occasionally, an LP-gas air mix is used in place of straight vapor, if the additional volume that may be derived from the use of air is advantageous. In some cases, the thermal value of the LP-gas air mix is somewhat higher than the base gas, compensating for the higher specific gravity of the former. If the Btu value is to remain the same, it is generally best not to increase the specific gravity by more than 20%.

Reforming

Reforming is also of considerable importance in increasing set capacity for peak periods. Reports show an increase in some sets of from 20% to as high as 40% depending on the generator, offtake main, scrubbers, exhausters and purifiers. LP-gas in the liquid or vapor state is usually introduced into the set at the top so that it will generally pass through the fire with the down-run. The resultant low specific gravity gas is brought up to standard with additional blow-run gas and the heating value standard may be maintained by enrichment.

This method has an increased advantage in that it can maintain a lower final specific gravity gas than is possible with the addition of LP-gas vapors or LP-gas air to the base gas. Also, fewer Btu are used in sending out large volumes of mixed gas. This may be of value in a system where it is necessary to hold to low maximum specific gravity. It is not necessary to use LP-gas in this fashion for the entire day or season, but may be used only to carry the plant over each day's peak, depending on the LP-gas supply available. The economics of this type of use is something that also must be determined for each individual company.

It can readily be seen from the above various means of utilization

TABLE 1. AVERAGE PROPERTIES OF LIQUEFIED PETROLEUM GAS PRODUCTS

	Commercial Propane	Industrial Propane	Commercial Butane	Commercial Pentane G-5B
Vapor pressure lbs./sq. in. gauge				
at 70°F.	124	122	31	——
at 90°F.	167	165	49	——
at 100°F.	192	190	59	18.7 (Reid)
at 105°F.	206	204	65	——
at 130°F.	286	282	97	——
Specific gravity of liquid (60°/60°F.)	0.509	0.511	0.582	0.626
Initial boiling point at 14.7 Psia °F.	—51	—51	15	83
Weight per gal. of liquid at 60°F., lbs.	4.24	4.26	4.84	5.21
Mean Coefficient of Thermal Expansion, Liquid:				
0— 50°F.	.00145	.00145	.00104	.00084
50—100°F.	.00186	.00184	.00122	.00092
Dew point at 14.7 Psia °F.	—46	—45	24	90
Specific heat of liquid, Btu/lb./°F. at 60°F.	0.588	0.587	0.549	0.537
Cu. ft. of gas at 60°F., 30 in. hg. per gal. of liquid at 60°F.	36.28	36.18	31.46	28.05
Specific volume of gas, cu. ft./lb. at 60°F., 30 in. hg.	8.55	8.50	6.50	5.38
Specific heat of gas, Btu/lb./°F. at 60°F. (Cp)	0.404	0.401	0.382	0.376
Specific gravity of gas (air=1) at 60°F., 30 in. hg.	1.52	1.53	2.01	2.60
Ignition temperature in air, °F.	920-1020	920-1020	900-1000	890-1000
Maximum flame temperature in air, °F.	3595	3600	3615	3590
Percent gas in air for maximum flame temperature, %	4.2-4.5	4.2-4.4	3.3-3.4	2.6-2.8
Maximum rate of flame propagation in 25-mm. tube:				
Cms. per second	84.9	85.9	87.1	83
Inches per second	33.4	33.8	34.3	32.7
Limits of inflammability in air, gas per cent in gas-air mixture:				
At lower limit, %	2.4	2.4	1.9	1.5
At maximum rate of flame propagation, %	4.7-5.0	4.7-4.9	3.7-3.9	2.9-3.1
At upper limit, %	9.6	9.6	8.6	7.6
Required for complete combustion:				
Cu. ft. O_2/cu. ft. gas	4.9	4.9	6.3	7.9
Cu. ft. air/cu. ft. gas	23.4	23.4	30.0	37.6
Lbs. O_2/lb. gas	3.60	3.59	3.54	3.55
Lbs. air/lb. gas	15.58	15.52	15.3	15.37
Products of complete combustion:				
Cu. ft. CO_2/cu. ft. gas	3.0	3.0	3.9	4.9
Cu. ft. H_2O/cu. ft. gas	3.8	3.8	4.6	5.9
Cu. ft. N_2/cu. ft. gas	18.5	18.5	23.7	29.7
Lbs. CO_2/lb. gas	3.0	3.0	3.1	3.0
Lbs. H_2O/lb. gas	1.6	1.5	1.5	1.5
Lbs. N_2/lb. gas	12.0	11.9	11.8	11.8
Ultimate CO_2 % by volume	13.9	13.9	14.1	14.2
Latent heat of vaporization at boiling point:				
Btu per lb.	185	184	167	153
Btu per gal.	785	784	808	797
Total heating values (after vaporization):				
Btu per cu. ft.	2522	2537	3261	3926
Btu per lb.	21560	21570	21180	21130
Btu per gal.	91500	91800	102600	110100

The above properties are those of the average products under the corresponding specifications. Blends of one or more of the above products or additional liquefied petroleum gas products having any desired properties can be furnished to customer's specifications.

Information concerning properties of special hydrocarbon products and solvents is contained in other Phillips Petroleum Company publications which can be furnished on request.

that LP-gas is extremely versatile in its applications, and can be worked into almost any manufacturing gas plant's operation in an advantageous way, peculiar to that plant's methods.

Past experience has shown that it is fairly easy to determine the percentage and heating value of the LP-gas air mix that can be added to a base gas so that the resultant mix causes a minimum of service complaints. The Knoy formula is particularly useful in this respect.

Beyond The Mains

THE other problem is one that has confronted most all gas utilities from time to time: assuring or reserving gas loads beyond the present distribution system until the mains can be economically extended to handle the load. There are generally two different situations that frequently must be met. The first is that caused by the present main system to a certain location being so undersized that no additional load can be added to handle any proposed extension without major changes either in the piping or the distribution pressure. These changes could entail enlarging the system or a change of plant equipment with the

necessary addition of regulators on the distribution system. In either event, the cost of such changes may make them undesirable in relation to the load that can be immediately added. The second situation is one where no distribution exists. Both of these problems can be handled by the use of LP-gas.

As we stated before, many manufactured gas utilities already have some LP-gas equipment installed—at least unloading and storage facilities. With a comparatively small amount of additional equipment, means can be provided for filling cylinders or tank trucks. This equipment would consist of a pump, filling manifold and weighing scales or if the "one drum" system is to be used, a truck filling station.

Serving Housing Projects

In many localities today housing facilities are being constructed in numbers ranging from a few units to several hundred. In some cases these are being located in areas some distance from existing gas mains. There are a number of different methods of serving these with LP-gas.

Probably the most simple method is the expedient of installing "two drum" systems, each usually consisting of two 100-lb. cylinders and a regulator for each housing unit. This system would be capable of handling cooking, water-heating and refrigeration.

Another method would be the installation of "one drum" systems with aboveground tanks of perhaps 100 gal. or more capacity, depending on the local requirements. The gas would be metered to the customer, and his supply replenished by tank truck delivery. This system can support a larger load, due to the increased vaporizing and storage capacity.

Metered Service

Following these two methods is the plan of installing a 1200-gal. or greater sized tank and serving a group of units through metered service. Since storage would be greater in this case, space-heating can be more easily served. This has an additional point in its favor, in that these tanks could be filled during off-peak gas plant usage, thereby enabling more constant year-round deliveries from the LP-gas marketer.

Of course, regardless of the method adopted, it would be necessary to convert the appliances from undiluted vapors to the lower-Btu gas when a tie-in is made to the regular distribution system. The cost of equipment for making diluted gas for any of the above systems that would be closely interchangeable, would not be justified.

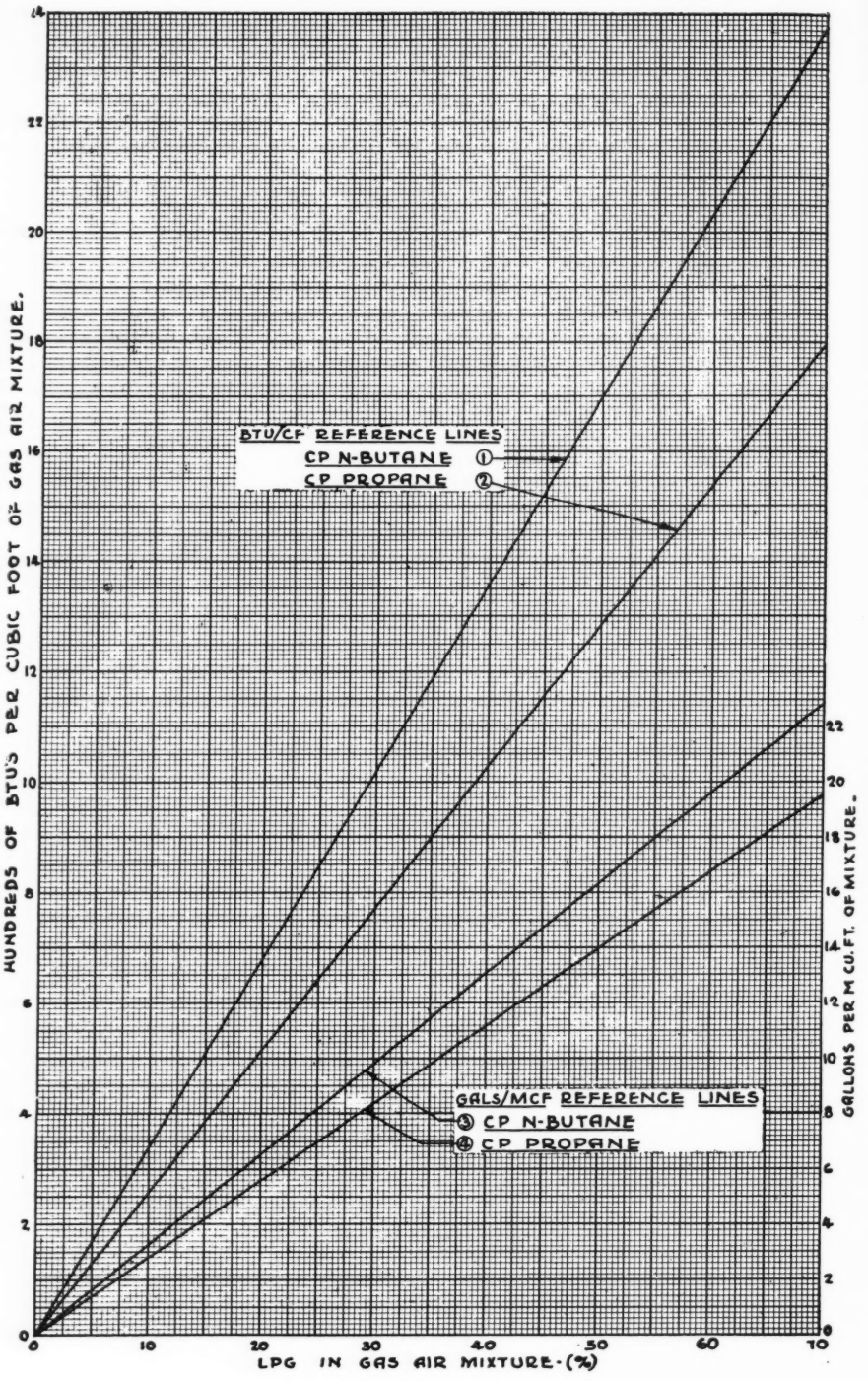

HUNDREDS OF BTUS PER CUBIC FOOT OF GAS AIR MIXTURE.
GALLONS PER M CU.FT. OF MIXTURE.
LPG IN GAS AIR MIXTURE-(%)
BTU/CF REFERENCE LINES
CP N-BUTANE ①
CP PROPANE ②
GALS/MCF REFERENCE LINES
③ CP N-BUTANE
④ CP PROPANE

FIG. 1-HEATING VALUES OF GAS AIR MIXTURES AND QUANTITIES OF LPG REQUIRED.

After the load in any of these instances is built up to the necessary volume, the main extensions or improvements to that section can be made and tanks and other equipment moved to another location, and the cycle started again.

Investment

The investment to provide any of the LP-gas services discussed will vary considerably with the type of service, the locality and, of course, general business conditions. By way of background, it is estimated that an investment of approximately $165 per customer is required to extend a city gas distribution system, assuming normal customer concentration, which is frequently not the case outside the present mains. An additional $45 cost is necessary to run a gas service. These figures assume intermediate pressures and all-residential users,

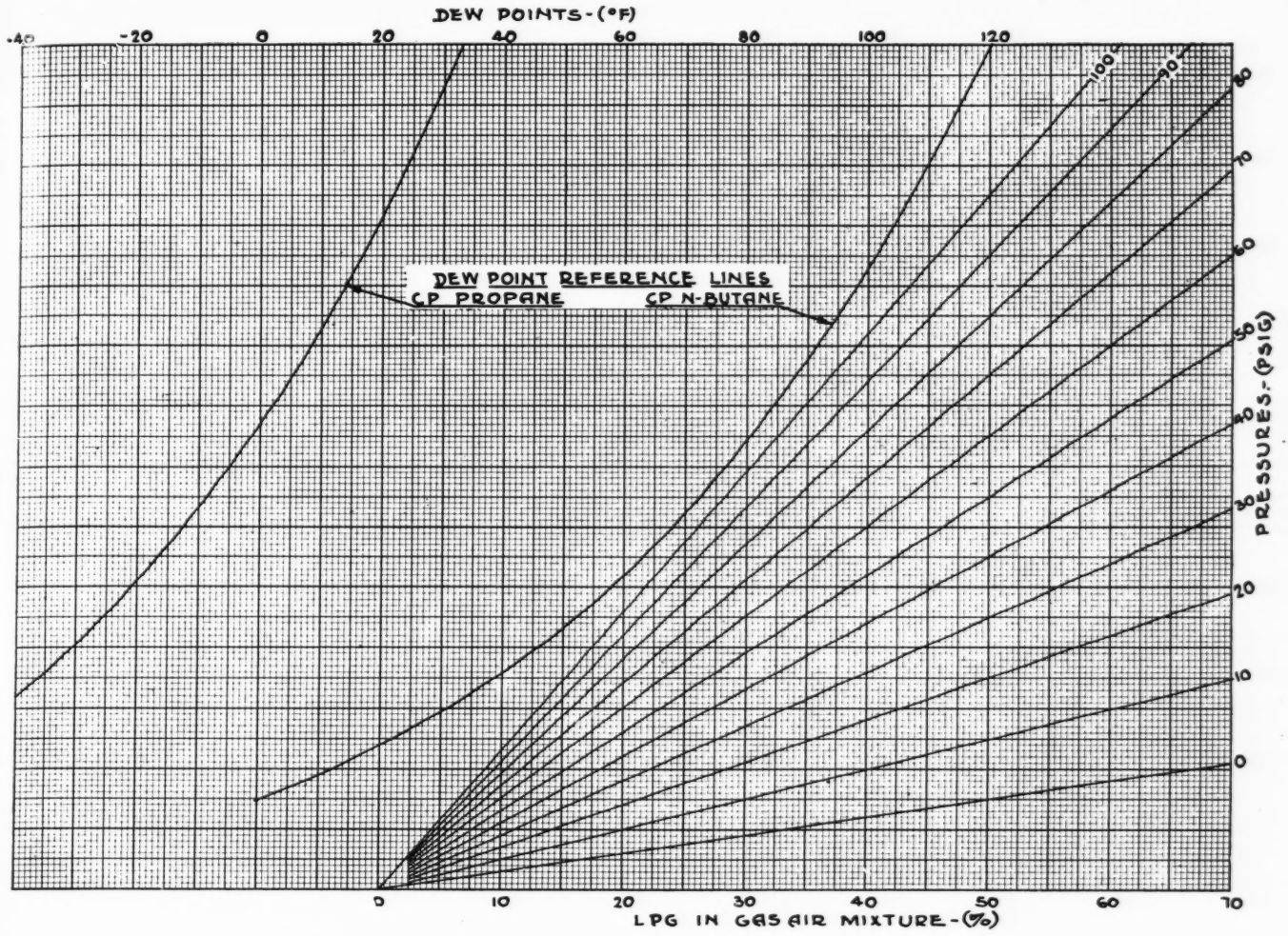


FIG. 2 - DEWPOINTS OF GAS AIR MIXTURES.

TO USE THE CHARTS.

FIGURE 1

Read right from the Btu scale to the proper reference line (1 or 2) and down to the percentage scale reading the portion of LPG in the mix. Read up from the percent LPG in the mix to the proper reference line (3 or 4) and read at right the quantity of LPG required to make 1000 cu.ft. of the mixture.

Thus, to find the amount of N-Butane per M cf of a 750 Btu gas air mixture and the portion of N-Butane in the mix read right from 750 Btus to reference line 1 and down to 22%. Also where the 22% line crosses reference line 3 read right finding 7.2 gals per Mcf.

FIGURE 2

Read down from the Dew Point Temperature scale to the proper reference line (propane or butane), then right to a point above the percent LPG in the mix finding the highest practical storage or distribution pressure by interpolating between the lines of gauge pressures.

Thus, to find the dew point gauge pressure of a 750 Btu N-Butane gas air mix at 0°F read down from 0°F to the N-Butane reference line and from there read right to a point directly above 22% (as previously determined from Fig. 1) finding the dew point pressure is slightly less than 20 psig.

and prices prevailing in April, 1947.

On the same basis, the investment required for a conventional "two drum" LP-gas system (100-lb. capacity cylinder) is approximately $50. A 100-gal. (420-lb.) tank truck delivery metered system ("one drum") would require an investment of approximately $95. Other "one drum" systems would cost from $75 to $100 per customer. The unit investment required for larger, multiple-unit systems would depend on the particular circumstances, but under proper conditions would show substantial savings.

A particular advantage of LP-gas in these cases is its flexibility. If circumstances arise that make it inadvisable to extend the mains, the LP-gas installations provide an eminently satisfactory permanent service, both to the customer, and to the company from an appliance sales and load-building standpoint. On the other hand, if and when the city distribution system is extended, the LP-gas installations can be recovered and are then available for "fringe" business, elsewhere at an extremely low investment figure.

Individual Odorizers for Domest

Fig. 1. General view of odorizer installation on a typical service setup. Consisting of a small tin can equipped with a round wick, it is connected to the houseline near the meter outlet by means of a nipple and tee.

TABLE 1. COST OF INDIVIDUAL ODORIZATION

Investment

700 cans and fittings @ $.50	$ 350.00
Installation costs @ $1.50	1,050.00
55 gal. of odorant	14.02
TOTAL	$1,414.02

Annual Costs

Operation and maintenance @ $0.84 per set	$ 588.00
Fixed charges (13%)	183.00
TOTAL	$ 771.00

Annual cost per consumer—$1.10

TABLE 2. OPERATING DATA

Location	Dates Installed	Refilled	Gas Volume Mcf	Odorant Used	Odorization Rate Gal./MMcf
Orange County	12-26-40	7-10-41	8.1	½ pt.	7.7
Division—2112	"	12- 9-41	7.9	½ pt.	7.9
Loma Vista,	"	6-10-42	43.8	1/3 pt.	1.0
Brea, Calif.	"	12-29-42	21.9	½ pt.	2.8
	"	6-29-43	38.0	½ pt.	1.6
	"	12-29-43	20.1	½ pt.	3.1
	"	6-29-44	42.7	½ pt.	1.5
	"	6-29-45	53.2	½ pt.	1.2

Presenting a simple, inexpensive odorizer for use on services which connect into lines transporting unodorized gas, based on experiences of the Southern Counties Gas Co.

THE Southern Counties Gas Co.'s experience with individual odorizers is rather limited because the practice of installing large transmission line odorization stations had been favored from the very start of odorant use in natural gas in the early '30s. The trend in the direction of large load odorization still continues for the reasons of lower costs per consumer, of greater improvements in design of mechanical equipment handling large loads as compared to smaller units, and of better control of odorant concentration when it is injected into a steady hourly gas load of a large transmission line.

The significance of additional and seemingly unnecessary expense connected with odorization of an entire distributed load, including that portion of the load which is transported for industrial use, where odorized gas is not required, gradually has been lessened as smaller and smaller volumes of gas are being diverted to industrial consumers in comparison with the loads intended for domestic consumers.

However, we have a few individual odorizers of small consumer type on one of the oil companies' gas lines which transports unodorized gas, and the operating and design data given herein shall be confined to their performance only and no other type.

Description

After considerable investigation into the feasibility of odorizing gas served to individual consumers, our company finally adopted a diffusion round-wick type odorizer which is very simple in construction and inexpensive in maintenance. (See *Fig. 3.*) It consists of a tin can connected to the house line at the outlet of the meter setup by means of a nipple and a tee. The odorant is carried from the can to the gas stream by means of a round wick. The average rate of odorant injection can be controlled by vary-

Presented at Distribution Conference, Pacific Coast Gas Association, San Mateo, Calif., in April.

Services

By N. K. SENATOROFF

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ing the length of wick projection into the gas stream.

A series of laboratory and field tests shown on the chart *(Fig. 2)* indicates the relationship of wick length exposure versus odorant diffusion rates, and also the variation of odorization rates per unit of volume with total load, the odorization being high when the rate of gas flow is low and low when the rate of gas flow is high.

No Complaints

At first it was feared that this fluctuation in odorant concentration would cause difficulties due to over-odorization of gas during the night when only pilots are being served, but no customers' complaints were encountered either during the first 10 months of experimental operation or since.

The size of the can, containing 0.143 gal. of odorant, sufficient to odorize 72 Mcf of natural gas at an average rate of 2 gal. per MMcf, was selected with a thought that normally the frequency of refilling the odorant shall be limited to one, or at the most, two refills per year.

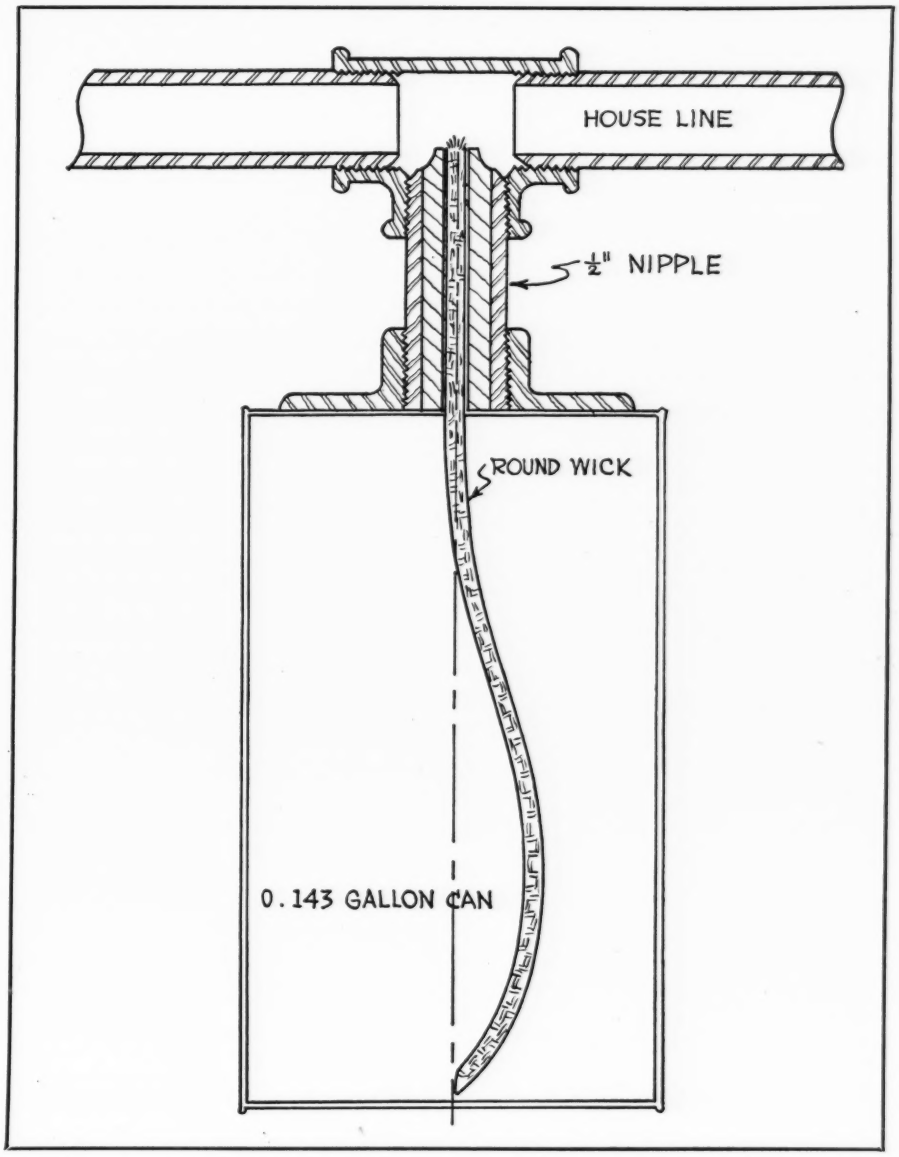

Fig. 3. (Above) Sketch of the odorizer. Average rate of odorant injection can be controlled by varying the length of wick injection into stream.

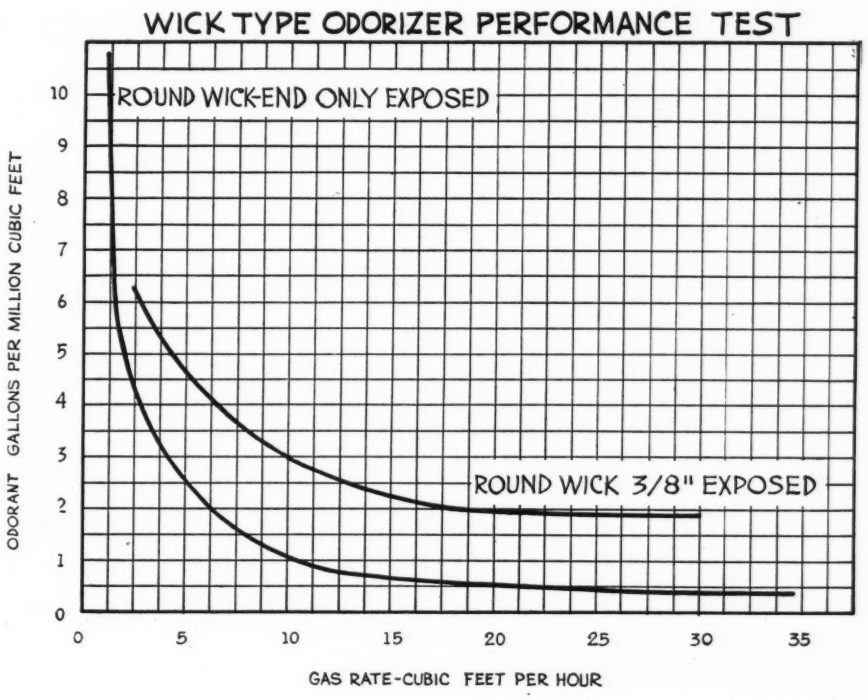

Fig. 2. (Below) Chart shows results of laboratory and field tests indicating relationship of wick length exposure versus odorant diffusion rates and variation of odorization rates per unit of volume of load.

The estimated cost of this type of odorization, submitted at the time of its adoption in 1936, was arrived at as shown in *Table 1.*

Table 2, comprising actual operating data of one of several individual odorizers in use in our company, shows the average rates of odorization in gallon per Mcf, the frequency of refills, and the total quantities of odorant needed for refills during the time interval of its operation.

Fig. 1 shows the general view of the odorizer installation operating data of which are given in the tables.

Gas-Fired Melting Pots Speed Production of Electrotypes

Installation of immersion-type heaters at Flower Steel Electrotype Co. brought three notable improvements over the old under-fired system: cleaner conditions, more efficient operations, decreased expense.

By JOSEPH C. MOORE
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SOME years ago the Flower Steel Electrotype Co. of New York, by replacing under-fired melting pots using coal with Kemp gas-fired immersion melting pots, cleared the way for increased electrotype output, and rendered its operations cleaner, less expensive, and more efficient.

Exclusive

By its nature, under-firing requires that the pot be suspended over an external combustion chamber of firebrick or other refractory material. Heat is then applied to the exterior of the necessarily thick pot walls and slowly driven through by conduction —a process which keeps the pot hotter than its contents and promotes needless cracking and burning and the formation of scale deposits.

The brickwork steals both space and heat, and imparts a "fly-wheel" effect to temperature control by giving up stored heat when lower metal temperature is called for and absorbing heat when fast temperature recovery is essential.

The coal itself, of course, requires extra labor for furnace tending, and is unsuited for automatic control.

The process of backing the copper shells is at present carried on at Flower in an alcove which is backed by a brick wall, partially enclosed at the sides by sheet metal, and totally covered by an overhead exhaust hood. The alcove is physically integrated with the other steps in preparing electrotypes. The previous step—that of building up the copper shells by electroplating—is performed but a step away from the alcove, and the succeeding step—that of sawing the backed shells to size—is but a step to the other size of the alcove.

Pot Construction

The new immersion heated pots are of welded construction. They are thoroughly insulated with 4 in. rockwool encased in 10-gauge black iron. Pots are about 3 ft. x 5 ft. and are waist high to facilitate the handling of the cast iron pans.

The immersion heating element is, as illustrated in *Fig. 3*, a rectangular, tubular steel, recirculating radiator of large heating area. Three of these elements are in each pot and are completely covered by the molten metal. They are spaced to give uniform heating throughout the pot. The burner head discharges a pre-mixed and completely combustible air-gas mixture under pressure into the lower horizontal cross-over. As indicated by the arrows, the combustion products are continuously recirculated, thus tempering the flame to produce uniform radiator shell temperature and consequent uniform heat liberation through the entire element.

Moreover, the high velocity of the circulating gases creates a vigorous "scrubbing" action against the side walls of the radiator. As a result, heat is transferred to the shell at a rapid rate, then released promptly to the melt through the thin shell wall.

Inert Gases Used

A portion of the hot, chemically inert and harmless exhaust is drawn off continuously through the vent hood above the burner and deflected over the surface of the molten metal. These gases act as a shield over the metal, thus excluding oxygen and thereby reducing dross formation.

Gas flows from the main line into the system through a 1-in. pipe and immediately enters a pressure governor set at the lowest pressure at which gas is ever likely to be supplied, say 1-in. water gauge pressure, so that, regardless of variation in incoming gas pressure, the gas will be delivered to the proportioning valve of the carburetor at a predetermined constant pressure. The proportioning valve automatically maintains a constant predetermined gas-air ratio to ensure complete combustion of the fuel.

Gas and filtered air are drawn in unison through the carburetor—750 cu. ft. of 550-Btu gas per hour capacity—by suction from a turbo-compressor. The air-gas mixture is raised to a predetermined pressure by the turbo-compressor and discharged into a 2-in. main which leads through to the pot manifolds. Gas flows to the burners through 1-in. supply lines furnished with individual shutoff valves and flash arrestors.

The metal used in backing the shells is made of 94% lead, 3% tin and 3% antimony. To keep this metal in a workable molten state, a temperature of 675°F to 700°F is maintained at the pots.

Temperature Control

An automatic mercury bulb indicator control keeps the metal at any desired temperature within plus or minus 2°F. Burners are automatically cut on and off to keep the temperature at the desired point. In addition to controlling the temperature during the day, the automatic control drops the pot temperature to 500° at quitting time and keeps it at that point during the night, automatically raising it again in the morning. The only time the metal is allowed to solidify is over the weekend. On Monday morning the burners are started about 6 a.m. so the metal will be molten by the time the shop opens.

Many Advantages

This unit has been in use now for about two years and fuel savings, thermal efficiency, automatic temperature control, faster melting, slower cooling, practical elimination of radiation loss, virtual elimination of maintenance work, and improved working conditions are the major reasons for the satisfaction expressed by the Flower Steel Electrotype Co.

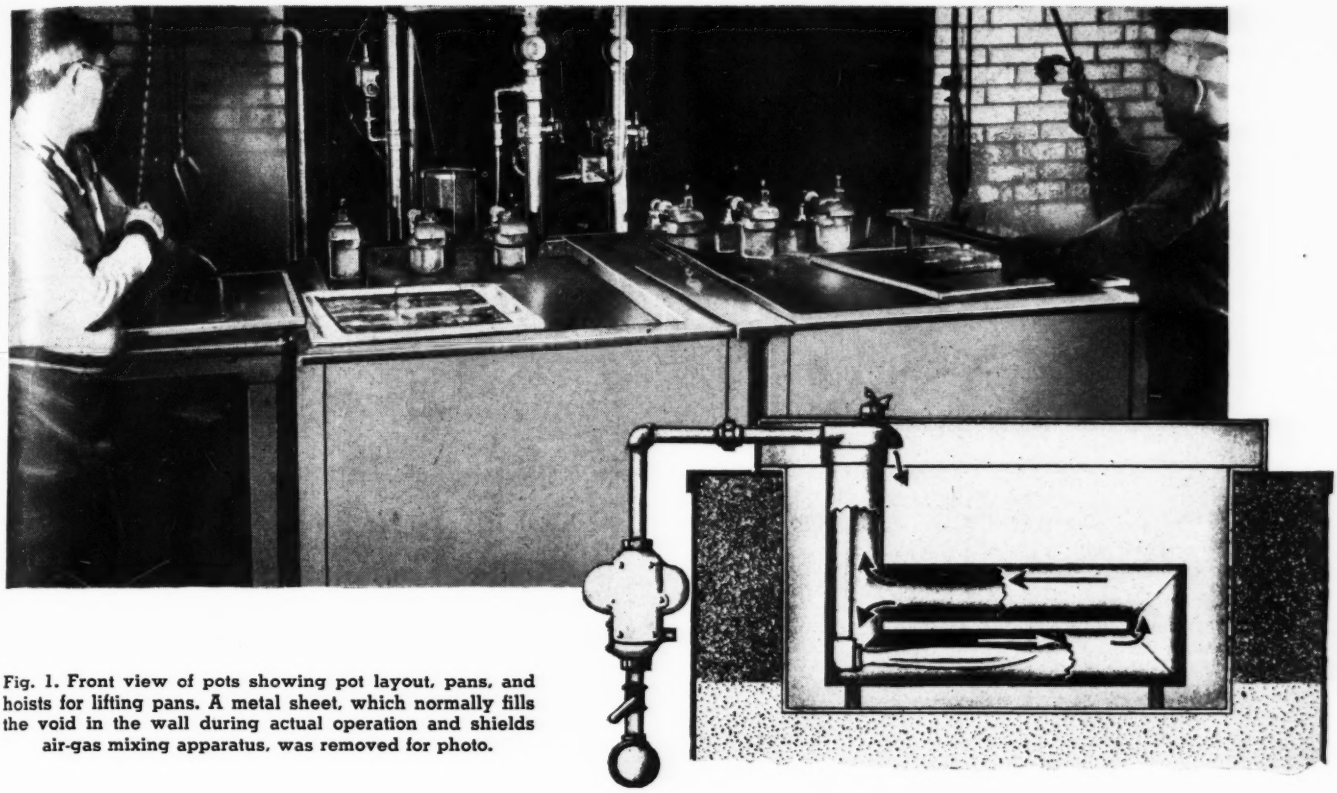
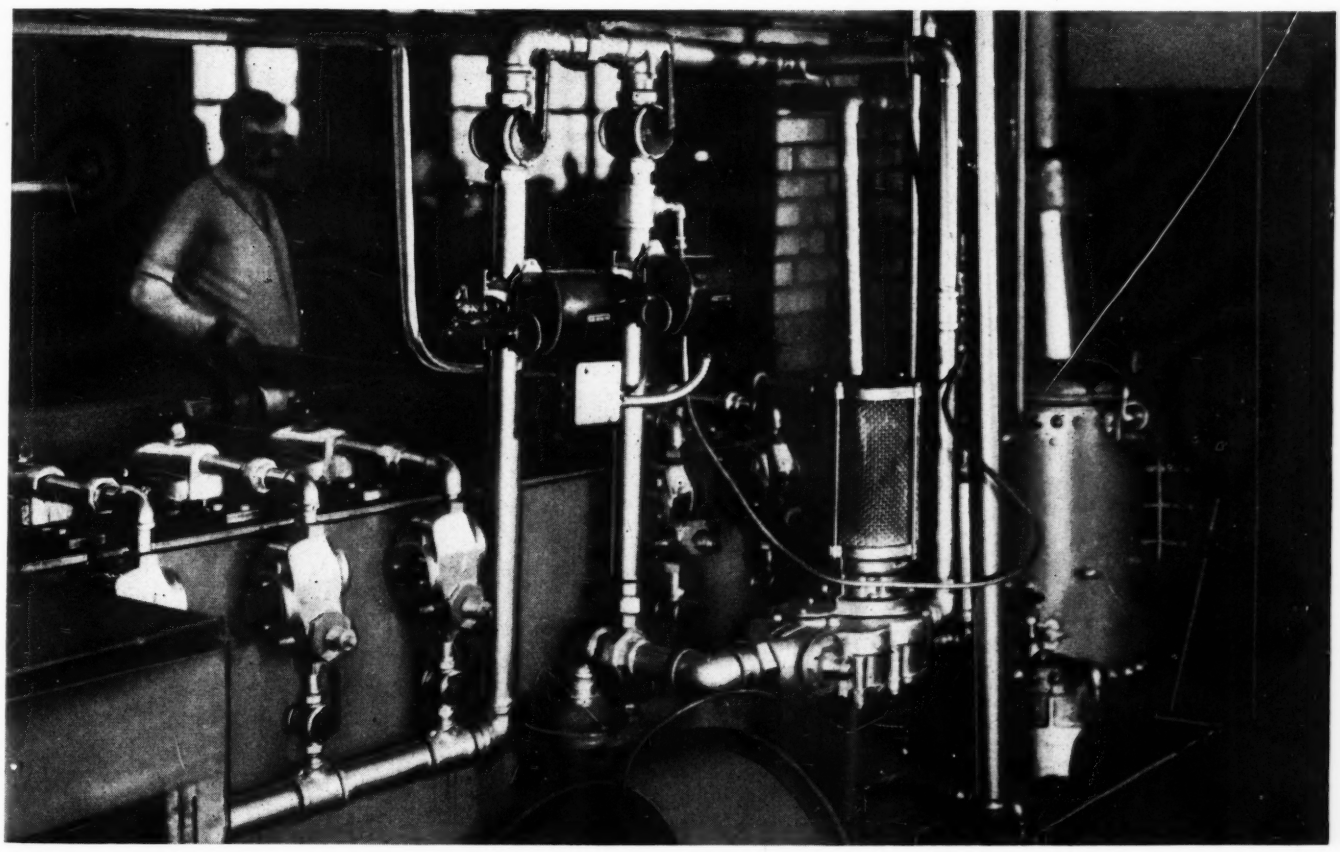


Fig. 1. Front view of pots showing pot layout, pans, and hoists for lifting pans. A metal sheet, which normally fills the void in the wall during actual operation and shields air-gas mixing apparatus, was removed for photo.

Fig. 2. (Below) Rear view of pots showing turbo-compressor and air-gas distribution lines. Melting pots, burners, and air mixing equipment are Kemp-manufactured.

Fig. 3. (Above) Immersion heating element. The element is submerged in the metal, and gives the following advantages: high thermal efficiency, on-the-spot temperature control, rapid heat recovery, uniform metal temperature, high casting rate, and reduced dross formation.



Public Opinion SURVEY

The AGA has announced results of a survey, conducted by Elmo Roper, which was designed to test public reaction to gas appliances. Highlights are presented on these pages.

HOME HEATING

Central Heating

Unsatisfactory rating *10%*

Reasons for dissatisfaction:

Unsatisfactory heating results 37.0%
(Mostly uneven or insufficient heat)

Unsatisfactory operation 34.0%
(Mostly too small plant or wrong outlet system)

No specific criticism 21.0%

Poor operating results 34.0%
(Improper installation; too dirty)

Too expensive 10.0%*

*Totals exceed 100% because some listed more than one reason for dissatisfaction.

Vulnerability of Competitive Fuels

Fuel	Vulnerable To Gas	Oil
Coal	36%	
Oil	25%	
Gas		4%

Trends: Principal ready market for additional central heating is in areas enjoying equitable climates; Californians and East-South-Central states were 10% in favor of changing to central heating.

In manufactured gas-served areas, about 50% wanted new oil central heating plants; 27% wanted gas.

Outlook: 60% increase in central plant heating installations if all those expressing their desires should actually *buy*.

Features most desired and/or appreciated in central heating plants:

1. Ease of operation
2. Cleanliness
3. Best all around heat
4. Less breakdowns and repairs
5. Low first cost
6. Low operating cost
7. Safety

Gas Floor Furnaces

Unsatisfactory rating *21%*

Reasons:

Operation unsatisfactory 38.5%
(Too dirty, poorly arranged, too small, gets out of order.)

No specific complaint 35.0%

Poor heating results 26.2%

Individual gas room heaters:

Unsatisfactory rating 34%

Reasons:

No specific criticism 54%

Poor heating results 25.7%

Those who had no opinions on the merits of gas wanted:

1. Cleanliness 12%
2. Ease of operation 14%
3. Least repairs 40%
4. Best all-around heat 21%
5. Least cost new 49%
6. Least cost to run 35%
7. Safety 12%

RANGES

	Using Electric Range (11% of total)	Using Gas Range (71% of total)
Dissatisfaction with present range	15%	22%
Age of ranges		
More than 10 years old	18%	35%
Age unknown	2%	5%
More than 10 years old, or age unknown	80%	60%
Less than 10 years old	80%	60%
(Less than 5 years old	27%	21%)
Principal reasons for above dissatisfaction were:		
Certain features of range or its operation	72%	76%
Too old or worn out	16%	18%
Doesn't work or isn't regulated properly	18%	14%
Not modern enough	12%	13%
Just want a new or different range	5%	12%
Lacks regulator or timing device	3%	12%
Too small	16%	10%
Not insulated		5%
Smokes up kitchen	2%	4%
Unattractive	3%	3%
Poor baking	2%	5%
Too slow	12%	2%

Remarks: 28% of gas range owners were vulnerable to electricity. Nearly half of these had gas ranges over 10 years old. 30% indicated they did not know the merits of a *modern* gas range. Vulnerability of electric range users to gas was much lower, although it increased with the age of the group.

Most desired features in new ranges:

1. Automatic cooking features 42%
2. More modern conveniences 44%
3. Clean range and kitchen 24%
4. Easy to cook on 34%
5. Cook foods better 59%
6. Speed 29%
7. Cool range and kitchen 31%
8. Least cost to operate 41%
9. Least cost to buy new 43%
10. Safe 7%

Automatic cooking: Those who thought automatic cooking would represent great improvement 78%

What "Automatic operating facilities" means to women

Oven

Automatic "on" only	4.0%
Automatic "off" only	15.5%
Automatic "on and off"	24.0%
Automatic oven time control "on" and/or "off"	43.5%
Thermostatic temperature control only	8.0%
"Automatic oven"—not specified	14.3%
Total—automatic oven time and/or temperature control	65.8%

Other than oven

Timing device—not implied above	10.4%
Auto. lighting—not implied above	1.6%
Cooking well	1.7%
Device to cook "as soon as possible"	.4%
Other	4.7%
Don't know	17.9%
No answer	1.1%

Appliance Ratings

Equipment Regarded as Most Important in the Home:

Refrigerator	53.3%
Range	29.5%
Washing machine	38.6%
Central heating	13.4%
Other heating	5.5%
Water heating	2.4%

In this questionnaire, as well as on all the others listed on these pages, percentage totals will exceed 100% as more than one answer was given to many of the questions.

Recommendation: That New Freedom Gas Kitchens continue to be nationally advertised, but on a reduced scale.

What People Think of The Industry

Although the survey was not intended to accomplish the same results as the oil industry survey—that is, to find out what people think of the industry and its services—it did unearth some definite opinions on these subjects:

1. The gas industry ranks favorably in the public mind in comparison with the two other principal utilities.

2. On the question of excellence of service rendered by the utility, gas outranked the others.

3. Gas led the other utilities in the matter of courtesy shown by employees in customer dealings.

4. Gas rates were found to be most reasonable of the three.

5. Gas utilities were also first on the question of which local utility was believed to consider the good of the community above its own interests.

(The AGA did not reveal what the margin of leadership was on any of these questions.)

RECOMMENDATION: That gas companies take a greater part in community matters.

REFRIGERATORS

77% of total queried used electricity.
3% used gas.
Age of refrigerators affected dissatisfaction rating:

	Electricity	Gas
Unsatisfactory rating	17.6%	15.5%
More than 10 years old	28%	22%
Age unknown	5%	5%
More than 10 years old, or age unknown	33%	27%
Less than 10 years old	67%	73%
(Less than 5 years old	19%	23%)
Principal reasons for above dissatisfaction were:		
Too small	28%	28%
Want something new	13%	20%
Not modern	16%	5%
Gets out of order	14%	7%
No deep freeze compartment	8%	7%
Poorly arranged interior	6%	7%
Too noisy	5%	1%
Hard to keep clean		2%
Doesn't get cold enough	5%	11%

Remarks: Electric refrigerators more than 10 years old were shown to be more vulnerable to gas competition than vice versa. Sales potential, as expressed by the surveys, is 75% more gas refrigerators than now in use.

Most desired features:

1. Best preservation of plain and frozen foods 62%
2. Most convenient arrangement and ample storage space 72%
3. Least needed repairs 59%
4. Least noise 43%
5. Least cost to run 56%
6. Safe 13%

WATER HEATERS

Types of service encountered:

Hot water service from landlord	21%
Stove connection or top-of-stove heating	16%
Responsible for own water heating	
Central plant hookup	11%
Separate heaters	50%

Of those who were responsible:
3% use oil, 8% use electricity, 78% use gas.

Separate Water Heaters

Dissatisfaction rating	20%
Of these, wanted automatic heater	40%
No specific criticism; wanted something new	27%

Summer-Winter Hookups

Dissatisfaction rating	9%
Because—	
No hot water when furnace is off	45%
No specific criticism	11%
Insufficient supply of hot water	10%
Preferred another fuel	10%

Overall dissatisfaction

Automatic	6%
Non-automatic	37%

Recommendation. Growing satisfaction with automatically-controlled summer-winter water heater hookups should be exploited.

Opinions. More people want central plant water heating hookups; fewer (by a small number) want separate water heaters.

Vulnerability of Competitive Fuels

Fuel	Vulnerable To Gas	Vulnerable To Oil & Electricity
Coal	48%	
Oil	24%	
Gas		11%

Conclusions

Excellence of gas service was found to be more important than the level of gas rates, according to those rendering favorable opinions in the survey.

Dissatisfaction and vulnerability to competition were traceable to operating and convenience characteristics of appliances rather than to rates or excellence of service.

Ignorance of many of the convenience and operating features of modern appliances was found to be widespread. Basic improvements needed, using the CP gas range as an example, would be as follows:

1. Better and cheaper automatic features.
2. Cleaner range.
3. Tighter door seals.
4. More efficient oven.
5. Cooler oven surface temperature and cooler kitchen.
6. Quicker oven preheat.
7. Lower gas combustion.

General Recommendations

National advertising. More emphasis upon automatic gas ranges and cooking and less emphasis on New Freedom Gas Kitchens and automatic water heaters.

Emphasis on the fact that CP ranges are modern.

Local tie-in by gas companies with national advertising.

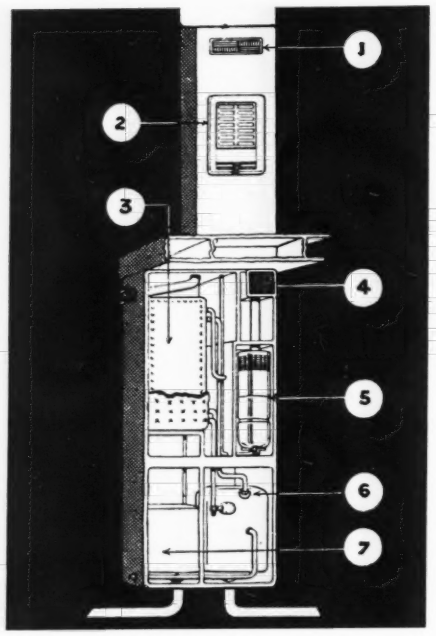
Emphasis on safety factors of gas appliances through testing procedures.

Emphasis on gas refrigerators in New Freedom Gas Kitchen advertising to help prove the modernity of gas.

Emphasis in gas water heating advertising on importance in modern home laundry.

Promotion. The new general promotion planning committee should integrate regular and special promotion activities with the national advertising program.

Improving CP gas ranges. Revision of present requirements and consideration of future revisions, especially cleanliness.



1. Warm air ducts in bedrooms.
2. Gas fire in bedroom.
3. Thirty-gal. insulated hot water tank.
4. Kitchen-vent for extracting cooking odors.
5. Gas circulator for hot water in summer.
6. Back boiler to living room fire.
7. Living room fuel cupboard.

WHAT'S NEW
In British Kitchens

The English are trying to make up for lost time

POSTWAR British kitchen equipment design has been dominated by two major essentials—the need to achieve maximum economy in operation, and the need to improve on somewhat crude prewar conceptions of form and finish.

The fuel shortage dictated the first trend and the lack of domestic servants the second. There has been, too, an immense upswing in public taste, engineered largely by bodies such as the British Gas Council, the British Electrical Development Association, magazine publishers and others.

It might be safe to claim that there never was any hesitation or lack of desire, prewar, to buy well-designed, attractive appliances. Financial considerations, however, controlled the market. Today, with a wide range of new appliances of attractive design, and of much improved efficiency on the market, the buyer is eager to make good the loss of nearly eight years marketing—and sellers are equally eager to swing trade in the direction of some particular fuel—gas, electricity, or solid fuel, as the case may be. All three interests have therefore done their utmost to reap a share of the harvest by planning the most attractive, efficient and economic appliances.

Another major effort has been that of selling the buyer a complete "packaged" unit. Realizing that the average buyer is in the market for a kitchen rather than a mere cooking appliance, all domestic equipment industries have concentrated on preparing, manufacturing, boosting and selling complete kitchens. In actual fact the component units in the electrical kitchen are fundamentally similar to those in the gas or in the solid fuel kitchen, with the exception of the actual operational appliances.

Let's look at such a typical plan and some of the appliances as advanced by the British Gas Council.

Grouped at Working Level

The basic idea here, as in all the schemes, is to group the component units continuously at working level around the kitchen walls, with either a continuous working top of plastic or metal over the units, or T-shaped sections fitted between to prevent the accumulation of dirt or waste between the working tops of the various components. In one such kitchen these include a gas multipoint water heater giving instantaneous boiling water, a built-in gas refrigerator, a sink in stainless metal with pot rack above and cupboards below, a gas wash boiler enclosed in a cupboard, a gas cooker, larder, broom cupboard, and storage units. All are gaily colored, with all piping totally enclosed, and the appliances are located at the most convenient points and storage and other facilities arranged conveniently adjoining.

Considerable use has been made of coke, thus giving the gas industry equal interest in gas and solid fuel. In one attractive unit, designed by the Ministry of Works, the heating and hot water service is supplied prefabricated in three sections, which form one unit when erected. A smokeless coke fire, with gas ignition, has a back boiler heating bath, basin, sink, towel rail, and drying cupboard, while a gas circulator fitted to the 30-gal. tank gives summer hot water.

Warm air is circulated to the bedrooms and adjoining rooms by means of ducts, regulated by controls over the coke fire, which heat most of the house. These warm air ducts are now a feature of all solid fuel, gas and electrical units in the newer houses.

Heated Sink

In some of the more expensive types the latest example of combined purpose, a heated sink, is incorporated. This sink is fitted with gas burners which permit the normal sink to be used as a boiler for the family wash. It has a close fitting lid and an extractor to prevent steam escaping into the kitchen. Made of stainless steel, the sink is insulated to prevent burning and has a double draining board of aluminum. A wringer fits into a wall recess behind the draining board and knobs of all the items are recessed to prevent accidents to clothes or children.

This kitchen is so arranged that the bathroom unit backs with it, a plan which permits unified ducting of all piping in a central and easily accessible duct. This feature is common among most of the modern kitchen and bathroom arrangements. Packaged kitchens are being fitted into working class homes on government instructions, and into private homes on private purchase, although here the priority for new housing is limiting the extent to which older houses can be fitted.

Apart from such unified grouped schemes, there has been a major change in the individual appliances. The same factors apply as in packaged units: attractive appearance, economy, efficiency, and safety, with appearance a big point. The old black gas cooker is dead in Britain. New finishes, mottled and coloured enamels, chromium, plastics, and pressed steel have replaced the older iron castings in most appliances. Safety "drop-down" taps, or "press-in" taps, easy-to-read thermostats, automatic lighting of the cooker hotplate burners, insulation by baffles of the hot plates, drop-down splashboards which become tables or working surfaces—all these are features of cookers which are all in bright, clean colours.

Water heaters have been streamlined, pipes hidden, and gas units have been redesigned to be clean, wall-panel shapes rather than highly decorated units.

Although not to be confused with a New Freedom Gas Kitchen, this kitchen represents a definite advancement in British design. White enamel, white glass tiles, and linoleum are extensively used. The parts around the sink can be removed for cleaning. Gas fires the refrigerator, the range, and a wash boiler installed under the drain board. A drying cupboard is heated by a fireplace in adjoining room.

The policy of "building in" units has been greatly extended. Built-in cookers and water heaters have been a recent development, with only control units remaining visible. Refrigerators, as a general rule, are also being built in, either as a unit in the line-up of the packaged kitchens already noted, or as a part of a cupboard arrangement at waist level. Immense developments in technical utilization have accompanied these redesigning efforts. One modern gas fire combines radiant heat with convected heat, draws air in at a side or foot louver and discharges it, warmed, into the room, from a control panel above the radiant fire proper. Other fires use non-aerated gas burners, giving a completely silent flame, from radiants of a new, almost unbreakable type. This type is so controlled as to be capable of reduction to one-third full heat without loss of efficiency, and gives an economy of at least one-third. In gas-ignited open coke fires, control levers have been introduced which permit the regulation of the speed of burning. By this method, time of burning can be varied from below 1 lb. an hour for 7 hours to 1¾ lb. an hour for 3 hours.

Other developments are appearing. "Neat" or non-aerated gas burners are being introduced on gas cooker hot plates, and faster grills are being designed. Coke boilers which can be switched over to gas during the summer are coming while gas refrigerators that are easier and cleaner to maintain are also due before long.

These examples will suffice to demonstrate that the gas appliance industry in Britain is definitely keeping pace with the necessities of modern life, and that design and performance are the controlling factors in the present policy. More than ever the gas industry is consolidating its share of the national fuel bill, in the domestic field, by attractive equipment, bold presentation, and imaginative but realistic satisfaction of the ideals of the average housewife.

BRITISH FUEL NEEDS FOR VARIOUS GAS-COKE COMBINATIONS

	House 1	House 2	House 3	House 4	House 5
Cooking	Gas cooker	Gas cooker	Gas cooker	Gas cooker	Gas cooker
Laundry	Gas wash boiler	Gas wash boiler	Gas wash boiler	Gas wash boiler	Gas wash boiler
Bedroom heating	Gas fires	Gas fires	Gas fires	Gas fires	Gas fires
Living-room heating	Coke fire[1]	Coke fire[1]	Coke fire with back boiler[1]	Coke fire[1]	Gas fire (Convector type)
Water Heating[2]					
(a) Winter	Coke boiler	Coke boiler	Back boiler (from coke fire)	Gas water heater	Gas water heater
(b) Summer	Coke boiler for baths Gas sink heater for kitchen	Gas bath heater or circulator Gas sink heater for kitchen	Gas bath heater or circulator Gas sink heater for kitchen	Gas water heater	Gas water heater
Annual fuel used					
(a) Coke	55 cwts.	45 cwts.	40 cwts.	20 cwts.	None
(b) Gas[3]	170 therms	195-215 therms	195-215 therms	335-355 therms	505-525 therms
Net coal required to make the gas and coke used.	(In the North some 20 to 30% more fuel would be used) 4 tons varying down to 3¼ tons.				

[1]A portable gas heater would be used in mild weather instead of the coke fire.

[2]Enough hot water for all purposes including four small baths for children and two large baths for adults per week has been taken as the figure on which the fuel consumption is based.

[3]If a refrigerator is included add 50 therms

All seven houses were equipped with gas kitchens, and two had gas all-year air conditioners.

Gas Appliances Hit of Tulsa Model Home Show

Lineup of modern homes which attracted thousands to the event. All have either five or six rooms; the home in the foreground at right utilizes the solar-type windows and a gas all-year air conditioning unit for comfort winter and summer.

By O. D. HALL

MORE than 20,000 visitors were shown the latest and best developments in household appliances and equipment during the first 12 days of the 1947 Model Homes Show which opened in Tulsa, Okla., May 15 for a 30-day exhibit. The homes are located in the 700 block, South Sandusky Ave.

Due to the alertness of natural gas utilities, dealers and distributors of natural gas appliances and equipment, gas kitchens were installed in all of the seven show homes, and two houses had central gas-air combination heating and cooling systems. A complete liquefied petroleum gas kitchen also was installed in one of the garages. Eighty-five Tulsa firms participated in the show.

The Oklahoma Natural Gas Co., which serves Tulsa and many other cities and towns in the state, participated heavily in the show, although it does not sell gas appliances.

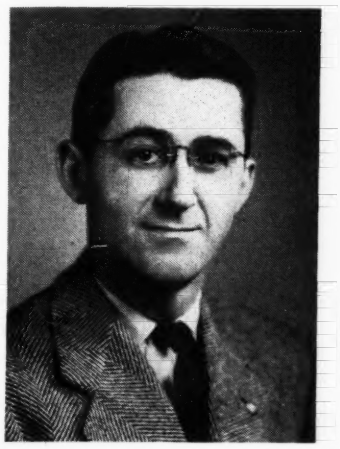
Months before the show opened, M. H. North, director of advertising and sales promotion, and Frank M. Thomas, sales promotion manager, worked with architects and builders of the seven model homes, impressing them with the importance and value of equipping their homes for the most advantageous utilization of natural gas. Appliance distributors and dealers also were encouraged to cooperate with the architects and builders in securing installations of their best equipment.

The show was given an initial boost by issuance of an attractive booklet in colors carrying advertisements of most of the firms which were participating, including inside-cover, full-page advertisements by the Oklahoma Natural Gas Co. and the Public Service Co. of Oklahoma, both statewide public service concerns. Oklahoma Natural also carried advertisements of the show in Tulsa newspapers and in other newspapers published in that area.

The show—and particularly the gas installations—was made the principal subject of broadcasts on the first two days of the show from homes which featured all-gas appliances. The "Woman's World" hour, a regular Oklahoma Natural Gas Co.-sponsored broadcast over Stations KVOO, Tulsa, and WKY, Oklahoma City, described the opening day parade, and continued with descriptions of installations in one of the all-gas kitchens. On the following day the broadcast was conducted from another of the all-gas homes in the show. The announcer also called attention to a "Morning Glory" model of the New Freedom Gas Kitchen, set up in a show window

One of the several types of all-gas kitchens which were installed in the seven model homes at the Tulsa show. This one is designed to fit small homes.

HOME SHOW PLANNER



Oklahoma Natural Gas Co. went "all out" on the Model Home Show in an effort to assure installation of a heavy majority of gas-fired appliances in the seven homes. Results, which were gratifying, were achieved chiefly through the efforts of Frank M. Thomas, sales promotion manager (pictured above), and M. H. North, director of advertising and sales promotion.

of the Oklahoma Natural Gas Co. headquarters in downtown Tulsa. The broadcasting was in charge of Julie Benell, producer and director of the radio department for Oklahoma Natural.

The kitchen planning department of the Oklahoma Natural also cooperated with the builders. Two of the model homes have their kitchens in the front of the house.

The campaign to secure installation of modern gas appliances was not easy sailing, as some models were still hard to get. Dealers had heavy backlogs of orders, and some of them hesitated to tie up merchandise for 30 days in the home show while customers were bombarding them for deliveries.

The fact that public utilities in Oklahoma are barred from selling appliances worked to the advantage of their representatives in securing the cooperation of dealers, as the latter felt that the utilities were not prejudiced in favor of any particular manufacturers' product.

Practically every type of gas appliance and equipment adaptable to smaller homes is found in the houses. Gas water heaters are in the laundry room of every house. Equipment includes two central gas-fired air-conditioning and heating units, floor furnaces, gas ranges and refrigerators, and water heaters. In one back yard is installed a new type garbage disposal unit which can utilize either natural or liquefied petroleum gas.

Keith Roberts, head of a Tulsa advertising agency, was the chief promoter of the show. He was chosen director by the Tulsa Home Builders Association and spent a year of intensive effort planning it.

The show is unique in that the seven houses are located in a row on a single site, although each was constructed by a separate home builder. They were built to sell from $10,000 to $21,500, are 5 and 6-room, one story houses of the best construction, and represent almost as many types of modern architecture as there are homes.

Los Angeles Show

Row after row of glittering displays stretching from the New Freedom Gas Kitchens, located in one of the choicest spots near the entrance, through 100,000 sq. ft. of floor space greeted visitors at the 11-day Construction Industries Home and Building Exposition of Southern California. The show opened June 12 in Los Angeles.

Five model kitchens were set up under the direction of Southern California and Sonthern Counties gas companies, utilizing cabinets by Quality, St. Charles, Servel, Youngstown, and Berger. Servel's all-year air conditioner was also featured, as were numerous individual gas appliance displays.

Two gigantic prizes were given away at the show; a complete, ultramodern $15,000 house and a postwar "wonder kitchen," equipped with Servel refrigerator and Tappan gas range. The latter contest, a race to pick Southern California's "happiest couples," was tied in with the radio show, "Bride and Groom," June 20, at which time the winners were announced.

Other stars of the show were complete rooms of furniture, bathroom displays, electrical homes exhibits, television demonstrations, and dozens of appliance and building material booths.

Revived Cooking Schools Fete 25th Year of Home Service at Chicago

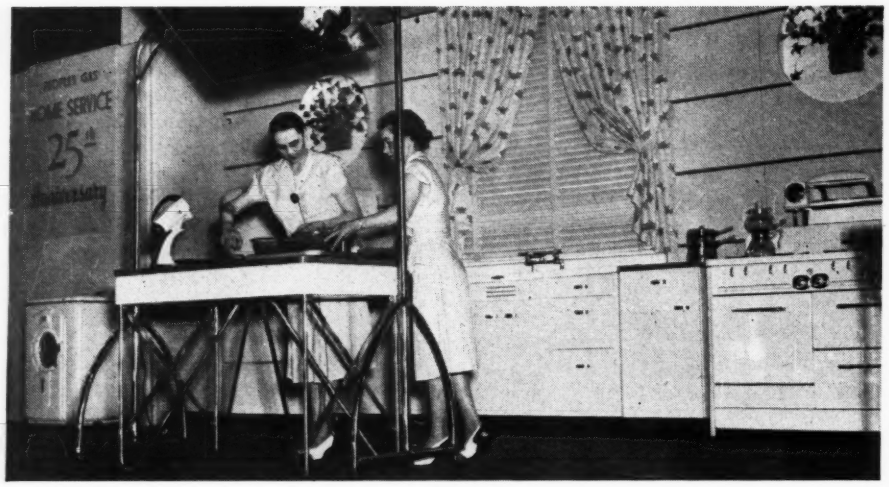
THE famed "Martha Holmes Cooking Schools," cancelled during war years, were resumed this spring at Peoples Gas Light & Coke Co., Chicago —and with a new twist. This being the 25th anniversary of Home Service at Chicago, special entertainment features depicted woman's lot, kitchenwise, in the early days.

Models paraded in authentic costumes of 1922, and a typical kitchen of that day was set up on the stage. As shown in the photo, one of the participants in the show presented a graphic view of the early-morning tribulations of a housewife of that day in preparing breakfast without the modern conveniences of New Freedom Gas Kitchens.

A dramatic demonstration of the transition from the old to the new was made in the sparkling kitchen in which Martha Holmes, assisted by Mary Swiston, prepared modern menus as part of the classroom instruction.

The shows, sponsored jointly with several of Chicago's neighborhood newspapers, were held in three theaters. Publishers aided the cause by

Bewildered, shivering housewife of 1922 is shown preparing breakfast without the advantages of a New Freedom Gas Kitchen, in this scene from the show at Peoples Gas Light and Coke Co. Occasion was resumption of Martha Holmes Cooking schools.



Other scenes from the silver anniversary show at Peoples. Above, Martha Holmes and Mary Swiston prepare a modern menu; at right, a model parades across the stage in a fashionable ensemble from 1922, the year Home Service at Chicago was born.

printing special supplements carrying publicity and advertising, which reached an estimated 330,000 readers. Gas appliance retailers also cooperated through extensive advertising.

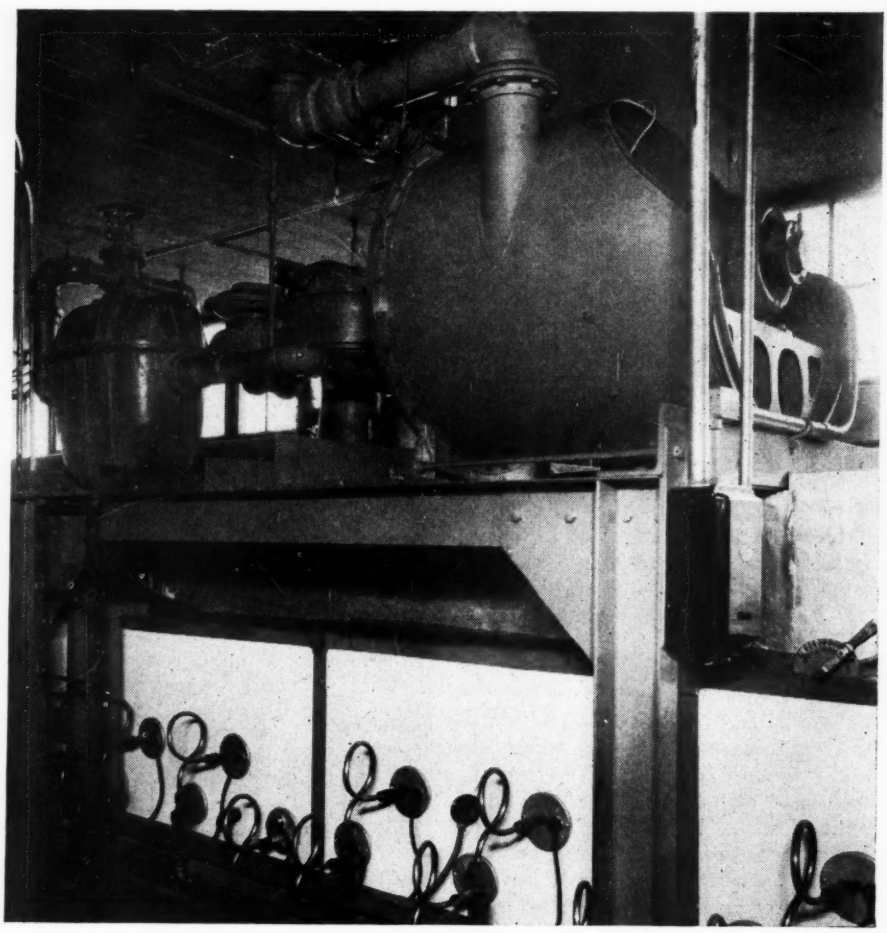
Success of the schools was proved by the attendance figure: 23,000 housewives were there.

Installation of Carburetor Atop Oven Saves Space

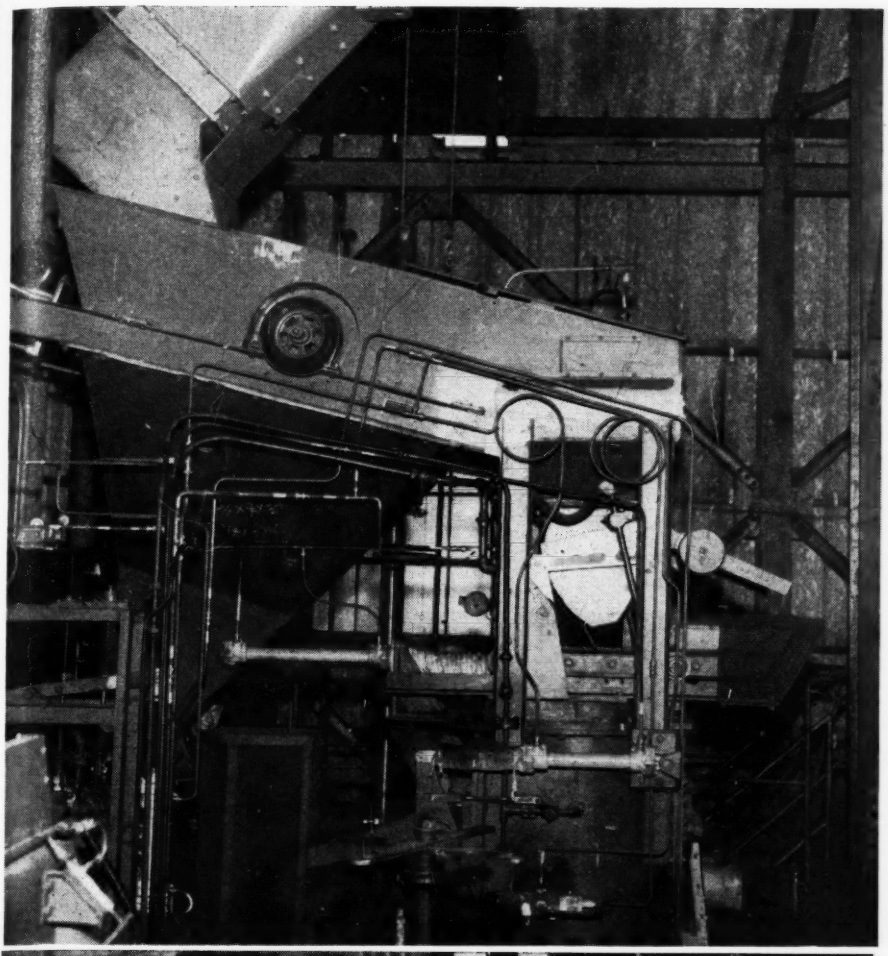
VERY often a substantial saving in floor space can be achieved and, at the same time, equipment can be isolated from floor hazards such as plant trucks and cleaning equipment by locating auxiliary equipment atop primary units, as is shown by this 250-ft. band oven roof installation of air-gas premixing equipment. An angle-iron structure supports the carburetion system and units are mounted to give workers adequate room for performing maintenance operations.

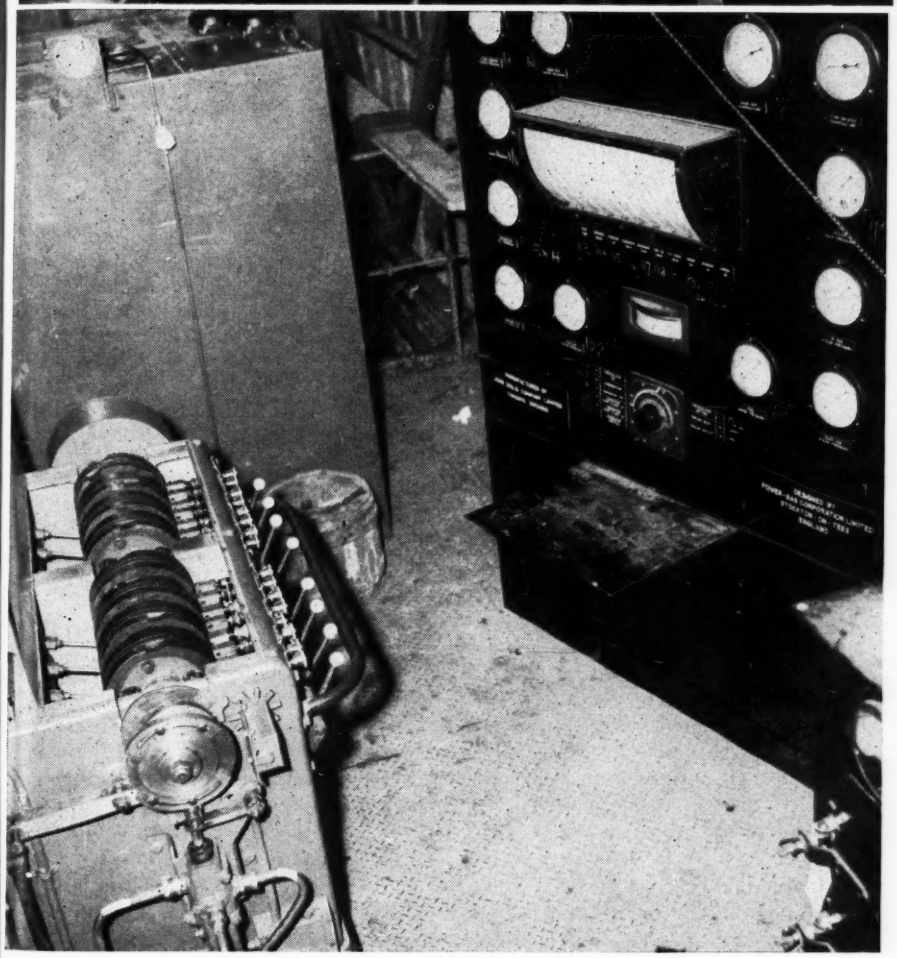
The carburetion system in this case is a Kemp "complete-pressure-premix" system—so that any one of the hundreds of burners may be manipulated without any effect whatsoever on any other burner—and such pressure carburetion systems involve considerable bulky equipment. Gas flows upward through a vertical main and can be sent directly to a pressure governor which discharges at atmospheric pressure into the carburetor; or it can be by-passed through a meter before entering the governor. Filtered air is drawn into the carburetor by means of a turbo compressor (large unit in foreground of *Fig. 2.)* The carburetor has a slide valve mechanism which automatically holds exact air-gas ratio irrespective of burner modulation, total heat demand, or variations in air or gas pressure. Air and gas are thoroughly mixed in the turbo compressor and discharged to an outside firecheck by way of the main leading up through the ceiling. From the firecheck, the air-gas mixture is distributed to automatically controlled burners.

Roof-top installations such as this one may be profitably employed in plants using japanning and paint drying ovens and also in plants using other gas-fired heating equipment.



Assembly of gas meter and carburetion system on top of oven.





B.C.'s New Water-Gas Machine

By F. H. FULLERTON

INSTALLATION of a Semet-Solvay type reverse flow water-gas machine was recently completely and put into operation in Victoria, B. C. The addition has a maximum capacity of 1.5 MMcf every 24 hours, and is completely automatic in operation.

Exclusive

The unit was designed and fabricated by John Inglis Co., Ltd., Toronto, in collaboration with their associates the Power Gas Corp., Stockton-on-Tees, England, and the Semet-Solvay Engineering Corp., New York.

Coke or coal may be used in the generator and diesel or bunker C oil for carbureting purposes.

A steam jacket generator is suspended over a Lymn-Rambush mechanical grate for the continuous extraction of clinker, propulsion being applied by means of a Lockheed drive. Provision is made for a portion of the heavy oil to be sprayed on top of the generator fuel bed during the gas making cycle.

Carburetor

The carburetor is of the checkerless type and contains only an ignition arch. Top and bottom is cone shaped and the vessel is suspended above the main floor.

The superheater is of the conventional type, containing checker bricks of Davison-Tooley design. A waste gas chimney surmounted by stack valve is provided for the superheater, which is arranged for later installation of a waste heat boiler if desired.

Coke is fed into the top of the generator by means of a mechanical coke charger, thus providing uninterrupted operation during replenishing of the fuel bed. (See *Fig.1.*)

An overhead bunker receives coke from a cross conveyor which in turn is fed from a gravity bucket conveyor in the existing vertical retort house.

AT TOP:
Automatic coke charger and hopper.

AT BOTTOM:
Automatic operator and control panel.

B. C.'s MACHINE

Reclaiming of coke from stock pile is carried out by means of a portable shovel and skip hoist which elevates fuel to overhead coke bunker. A vibrating screen is interposed between coke bunker and mechanical coke bunker for the extraction of fines.

Fully automatic operation is provided by an electrically driven controller of the single cam shaft type with double cams for each control valve. (See *Fig. 2.*)

The hydraulic equipment is of Lockheed manufacture, operating on a system where one end of each power cylinder is maintained at constant pressure, the other end alternating between pressure and drain to suit the operation of the control valves. A power cabinet containing a supply tank, electric motor driven pump, and reserve air loader accumulators is provided.

Machinery House

The machinery house contains electric and steam driven air blowers, electric and steam driven oil pumps, duplicate steam driven boiler feed pumps, duplicate wash box pumps and three electric driven centrifugal water circulating pumps—one for reserve use.

Cooling of the gas is effected by a Lymn Washer Cooler placed after the wash box. Apparatus is provided for separation of tar and water emulsion leaving the washer cooler and wash box with subsequent filtration. The filtered water is pumped over a wood slat cooling tower and is recirculated to washer cooler. Hot water obtained at end of filter bed is recirculated direct to wash box.

Auxiliary equipment, now being installed, consists of an electrostatic detarrer for removal of tar from gas stream, an electric driven Roots type station meter, and a static washer for naphthalene extraction.

W. H. Dreaper is superintendent of the gas department of the B. C. Electric at Victoria, B. C.

Gas Heats Large Steel Fabricating Plant

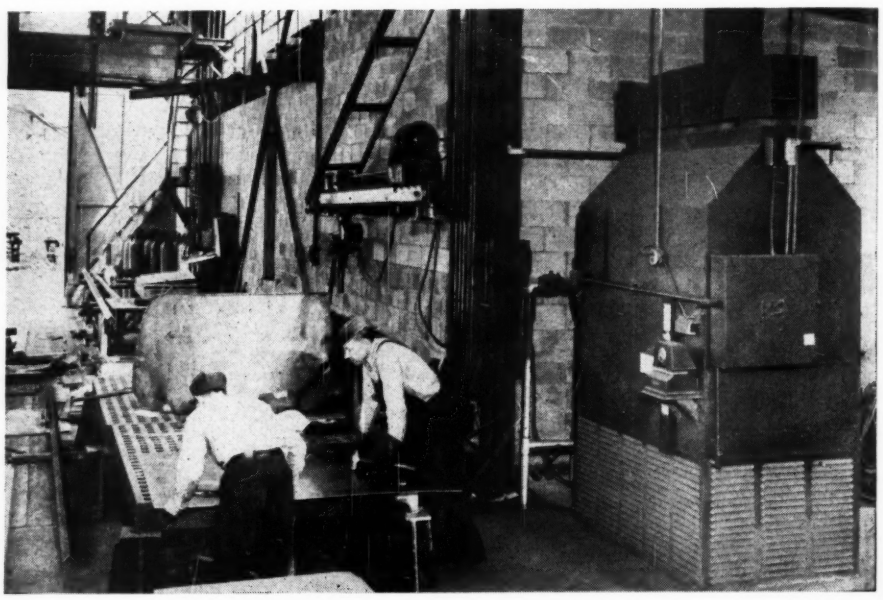
STRUCTURAL steel fabricating plants long have been difficult buildings to heat economically. They usually have high ceilings, uninsulated walls and large window areas that cause excessive heat losses.

The pot-bellied stoves and salamanders so often used not only are as ineffective as outdoor bonfires, but are costly in man-hours as they give the workers an excuse to warm their hands at frequent intervals.

But this heating problem has been solved in a fabricating plant just completed by Minweld Steel Co. in Pittsburgh. With a new system of space heating that operates on the principle of recirculation of warm air in the "working zone," a comfortable working temperature is maintained while, at the same time, roof heat losses are minimized. Company officials say the system is both efficient and economical.

The "heart" of the heating system is a single 750,000-Btu gas-fired warm air heater developed by Dravo Corp. of Pittsburgh—the Direct-Fired Counterflo Heater. (See photo.) This unit draws in cool air from all directions at the floor level, passes it over a highly efficient stabilized stainless steel combustion chamber, and then discharges the warm air at high velocity above the heads of the workers through four swivel nozzles. There is no appreciable floor draft, even a few feet away from the heater, because the air is drawn into the unit from all directions.

The Minweld Steel Co.'s building was erected in only eight weeks and is typical of modern structural-steel fabricating plants. It has a 40-ft. high roof, is well illuminated by an abundance of windows, and the walls of protected metal siding enclose a floor area of about 6500 sq. ft. Two 19-ft. square truck doors at each end make the heating problem more difficult. Despite this type of construction, heat losses are kept at a minimum because of the "working zone" recirculation method of heat distribution.



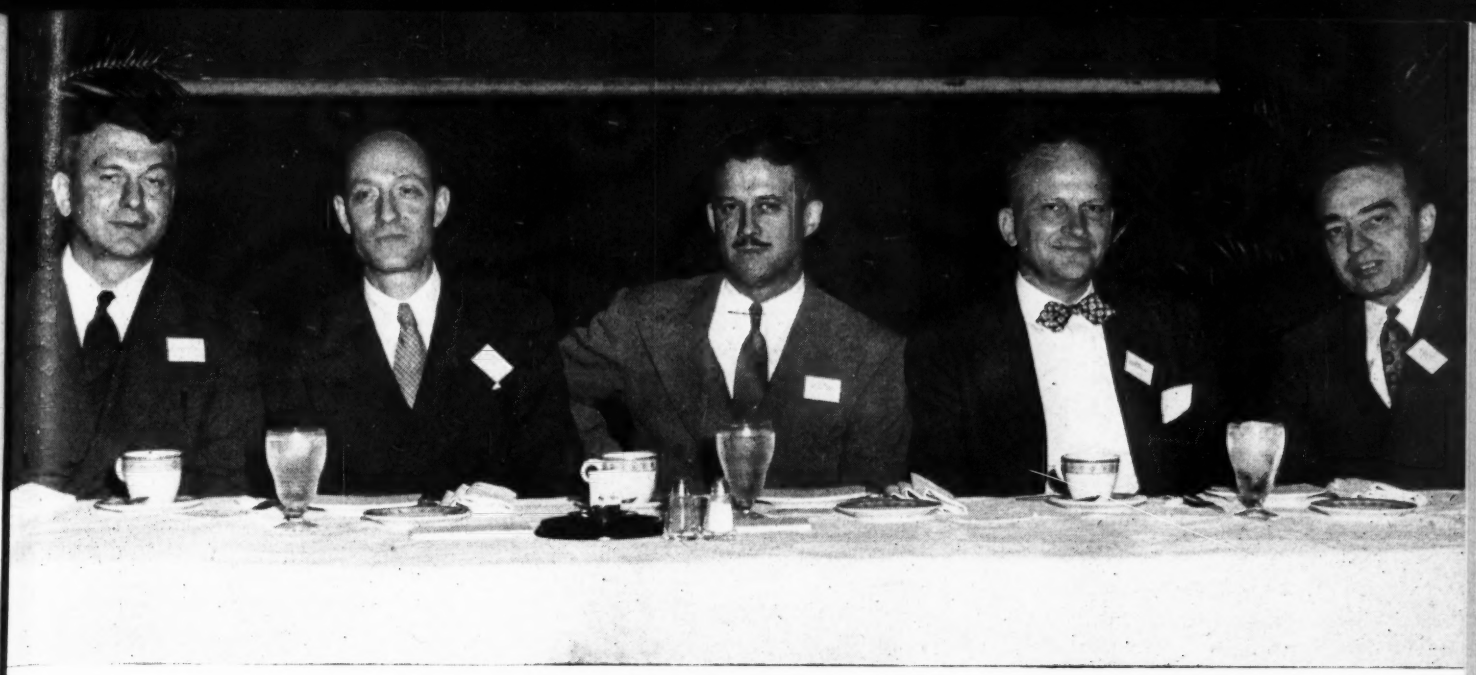
A corner of the Minweld Steel Co. plant in Pittsburgh showing the Dravo Heater, which maintains a comfortable working temperature in the large building by recirculating warm air in the "working zone." The heater draws in cool air from all directions at the floor level, passes it over a stainless steel combustion chamber, and then discharges the warm air at high velocity above the heads of the workers through four swivel nozzles.

William Minnotte, one of the owners, estimates the new heater saved 20 man-hours in a recent two-week period because the 35 employees did not have to stop work and try to get warm around old-fahioned coal stoves. In addition, he pointed out that there had been no trouble or expense of firing coal stoves and removing ashes.

Floor space being at a premium in the plant, the new heating unit has a secondary advantage in that it is comparatively small. The high temperature heat transfer in the combustion chamber permits a unit of relatively small size for its output. An expensive duct system also is unnecessary because the discharge of the warm air at high velocity gives a heating radius of 150 ft.

The heater is controlled thermostatically. At Minweld, the thermostat is mounted about 40 ft. from the heater and is set at between 60 and 65° F. The heater shuts off automatically when this temperature is reached.

Minweld is not working a night shift at present, so the heater is shut off completely at the end of the day and started again at 6 a.m. by the watchman, who has only to turn one switch to get it operating. The quick-heating feature of the combustion method establishes a comfortable working temperature in the building quickly.



ASSOCIATIONS

Challenge

Threat and promise seen in future at Production-Chemical Conference

SOME 600 gas engineers and chemists last month stood on the threshold of the greatest era of expansion in the history of the gas industry and tried, through the medium of the AGA's Joint Production and Chemical Conference, to get a glimpse of what it would be like.

AGA

Exploration of the future was intense and thorough, and embraced every conceivable phase of production practices. Even that ubiquitous question mark, atomic energy, was scrutinized.

The keynote of the entire meeting, as presented by S. Green, Brooklyn Union Gas Co., Production Committee chairman, was the challenge which the tremendous demand for gas is presenting technical men, who must improve and expand if they are to meet this challenge and turn it to opportunity. Managing Director H. Carl Wolf, who followed Green on the program, dwelt further upon the challenge and opportunity theme, mentioning the dual role as played by nuclear fission.

C. E. Paige, president, The Brooklyn Union Gas Co., analyzed "Send-out Growth" in a similar light, terming it both a threat and a promise. Illustrative was his company's expansion

PRODUCTION-CHEMICAL COMMITTEE MEET—From left, L. S. Schmidt, Bureau of Mines; F. E. Ceccarelli, Consolidated Edison; W. C. Wardner, Connecticut Gas Co., luncheon chairman; H. K. Merker, Brooklyn Union, alternate chairman; C. C. Russell, Koppers, Production Committee vice chairman.

INDIANA GAS ASSOCIATION—Elected president and vice president at the May convention: at left, L. B. Schiesz, Indiana Gas & Water Co.; Dean T. Burns, Citizens Gas & Coke.

GAS APPLIANCE SHORT COURSE—C. H. Dean, Heating Research Corp., Muncie, Ind.; Dr. F. T. Gardner, Tulsa University, director of course.

FLORIDA-GEORGIA GAS METERS—from left, W. H. Keefe, Florida Power & Light; Grace Mulcare, Mulcare Engineering, New York; P. R. Greenaway, Florida Power & Light, shown at April meet.

COMMERCIAL GAS SCHOOL—students at AGA school mull over 65 questions on final tests.

program, which in the space of two years was revised from a $5 million budget to one of $24 million. One threat involved in such expansion was the cost of the added service, and that the company is proposing to solve with an increased rate schedule.

Future possibilities in methods of manufacturing gas were presented by Dr. A. R. Powell, Koppers Co., Inc., Pittsburgh. He foresaw, among other things:

Bituminous coal and heavy fuel oil will be the principal raw materials for gas making in the Northeast. Some LP-gas will be used for extreme peaks.

Carburetted water gas will remain the major method of gas making for some time to come.

Processes developed in Germany and other foreign countries for gasification of coal are not now suitable for making city gas, although future experiments might modify this view.

Indicative of the trends in industry thinking was the popularity of two of the four luncheon round-table conferences. "High Btu Gas," presided over by J. G. McKinnon, Michigan Consolidated Gas Co., outdrew all other conferences, while "Chemistry in the Gas Industry," with B. Miller, Ozone Park, N. Y., presiding, provoked much discussion. The latter meeting was devoted in a large part to atomic power.

W. R. Fraser, Michigan Consolidated, Chemical Committee head, alternated with Green as convention president. The meet took place June 2-4 at the Hotel New Yorker, New York.

Gas Schools

250 men instructed in commercial and industrial subjects at AGA classes

A total of 250 gas men, representing half the states of the union as well as several foreign countries, gathered in Columbus, Ohio, and Washington, D. C., early in May for Industrial and Commercial gas schools sponsored by the AGA. Intensive week-long instruction greeted the men who came to learn more about the utilization and sales of gas in their respective fields.

Twenty-six subjects were presented in the lectures at the Industrial Gas School, held in Columbus, May 5-9, in a curriculum devised by John C. Dorsey, East Ohio Gas Co., Cleveland, and his committee. Most of the lectures fell into three seminars—on combustion, principles of furnace design, and new developments and specialized equipment. These covered activities for the first four days, with sales lectures and a "final" comprising Friday's work.

Faculty for the course included 25 of the foremost industrial gas men in the country. Chairmen included Karl Emmerling, AGA Managing Committee chairman; C. H. Lekberg, Northern Indiana Public Service Co.; F. T. Rainey, Ohio Fuel Gas Co.; S. T. Olinger, Cincinnati Gas & Electric Co.; and C. C. Eeles, Ohio Fuel Gas Co.

One hundred attended the commercial school, held one week later. Thirty-six subjects were treated in the lectures, including markets, various types of cooking equipment, food service terminology, kitchen planning, modernization, competitive fuels, customer contacts, installation, and selling. A committee headed by R. E. Wright, Negea Service Corp., Cambridge, Mass., planned the course, presented by a faculty of 30. Chairmen-for-the-day included Emmerling, H. A. Sutton, Public Service Gas & Electric Co., Newark, N. J.; W. S. Anderson, Boston Consolidated Gas Co.; Leon Ourusoff, Washington Gas Light Co., and R. E. Wright, Negea.

Production conference during filming of "Winning Seals of Approval" shows executives checking script. Clifford Hall, AGA assistant promotion director, is in the center; Carl Geltz, Cleveland laboratories, technical advisor, kneels at left.

Movie on Testing Ranges Completed

How gas ranges must perform in "Winning Seals of Approval" is the subject of a 16 mm sound-color film completed in May by the AGA for distribution to schools, utilities, and manufacturers. The film, which used a cast of 16 in 75 scenes, dramatizes the story of the rigid performance tests which the modern range must undergo at the association laboratories, carrying through many of the 600 tests utilized from the time the range is inspected on the production line until it is completely fabricated and given the approval stamp.

Ten CP ranges and two complete New Freedom Gas Kitchens play starring roles in the show. Demonstrations of the cooking abilities of gas ranges are also featured.

One hundred prints are scheduled for high school and college home economics class booking, with an audience in the next school year of one million as a goal. Fifty prints will be held for use by member companies who contributed to the research and promotional fund; other member companies and range makers may buy other prints at $115 each.

The Promotion Bureau supervised making the movie. Mary Swiston, Peoples Gas Light and Coke Co., Chicago, gave technical advice and supervised cooking shown in it.

AGA Notes

More Awards. One new award and modification of one of the five existing AGA awards was announced following a meeting of the Executive Board April 28. The action resulted from acceptance of recommendations made by a committee headed by W. C. Beckjord.

The AGA Gas Heating Progress Award, sponsored by Coroaire Heater Corp., is the new contest (as announced last month in GAS together with the revision of the McCall Home Service Award). The Munroe Award, highest honor in the industry, has been renamed American Gas Association Distinguished Service Award. Applications for this prize, donated by Past President C. A. Munroe, must be received by Aug. 1.

The other awards are the one for meritorious service, presented for a life-saving act; the Beal medal, for technical recognition, and the McCarter medals, also for life saving, specifying application of prone pressure method of resuscitation.

Industrywide Advertising Campaign. After Labor Day, an intensive gas range advertising and promotion campaign will be launched. Based on what the association learned as the result of the Elmo Roper public opinion poll, the drive will aim for a doubling of 1946's last-quarter national magazine ad budget. In three months, it is hoped, 98 million gas messages will appear. Manufacturers, dealers, and gas companies will receive portfolios suggesting methods of capitalizing locally on the national ads. Mats will be available in one color as well as in less-than-page size, so that local tie-ins may be made.

Range and Heating Requirements. A revised procedure for wall and floor temperature tests adopted by the gas range requirements subcommittee has been approved by the approval requirements committee, and will become effective Jan. 1, 1948.

Gas range requirements were overhauled in a subcommittee assignment which has not as yet won committee approval. Current requirements were evaluated as to safety, construction, performance, and serviceability, and some were modified while others were deleted.

Advanced Training for Lab Employees. Employees of the AGA Laboratories now have an opportunity to obtain advanced training in science and engineering and to fulfill the formal requirements for a master's or doctor's degree in these subjects, while continuing their regular research activities on a full-time basis. A cooperative plan for graduate study between the Testing Laboratories and Case School of Applied Science has been approved by the two institutions.

Under the plan employees may obtain advanced degrees from Case School by completing lecture and laboratory courses given by it (now available at evening classes) and undertaking research at the Laboratories which will provide thesis credit. Approval of individual projects must be obtained from the head of the proper Case department, the Dean, and the chief research engineer of the Laboratories.

Two New Reports on Controls. The Technical Advisory Group for Burners, Controls and Accessories Research of the Committee on Domestic Gas Research has approved for publication a report by the Laboratories on effects of ambient pressures in combustion chambers and has assigned to the Laboratories, for editing and publishing, a report on gum, dust and rust filtering prepared by the Arthur D. Little, Inc., organization.

Reservations for 1948 Convention. E. C. Brennan, Housing Secretary, American Gas Association, 511 Terminal Tower, Cleveland 13, Ohio, is the person to whom applications for hotel reservations for the annual convention, Oct. 6-8, should be addressed.

1948 Natural Gas Meeting. The Natural Gas Department has selected Houston, Texas, on May 4 and 5, for the place and time of its Annual Spring Meeting in 1948. Headquarters will be at the Rice Hotel.

Appliances

Importance of installation and servicing stressed at Short Course

ABSOLUTE dependence of the natural gas industry upon proper installation and servicing of home appliances and industrial equipment formed the central pattern for most of the papers, demonstrations and discussions during the three-day program of the second annual Gas Appliance Short Course at the University of Tulsa, Tulsa, Okla., May 26-28.

More than 250 registrants, mostly employees of natural gas utilities operating in 14 states, together with representatives of appliance manufacturing, distributing and retailing establishments, were on hand at all sessions.

The course was directed by Dr. F. T. Gardner, professor of chemistry in the college of petroleum sciences and engineering, University of Tulsa. The course was also sponsored by the Southern Gas Association.

The importance of maintaining proper customer relations was strongly emphasized in a talk by D. W. Reeves, general sales manager, Oklahoma Natural Gas Co., Tulsa. He presented a skit, written by Mildred Clark, Home Service supervisor of the Oklahoma Natural Gas Co., Tulsa, to illustrate the points of his paper.

A cutaway model of an automatic gas range was placed on the floor by Walter Zwiger, Geo. D. Roper Corp., Rockford, Ill., to impress on registrants the relative simplicity of this modern development in appliances.

The importance of gas-air conditioning in leveling the gas load, particularly in the residential and commercial fields, and increasing sales of gas, was cited by Dr. William R. Hainsworth, vice president, Servel, Inc., Evansville, Ind.

"Due to the vastly increased use of gas as a domestic fuel, the number of cases of asphyxiation and suffocation is increasing," Carl Dean declared in discussing the principles of proper venting. Dean, introduced as the "father" of the short course, said, however, that this probably is not an increase in percentage.

"The employees of the gas companies are the ones to sell our product and particularly our service to the customer and to keep him satisfied. We should get completely away from the idea that we are giving free service. The customer has already paid for and is entitled to servicing of his appliances," declared H. N. Oldham, Southern Union Gas Co.

Many other papers were presented at the general sessions, and more technical subjects were presented each afternoon in various class rooms of the university, under instruction by experienced technical and operating personnel furnished by the gas utilities and equipment manufacturing and distributing companies. The same subjects were repeated each afternoon so that registrants could attend each of the classes.

Technology

Field trips to cycling and dehydration plants mark Texas course

SANDWICHING in trips to dehydration and recycling plants between instructive lectures by leaders in the technical phases of gas production and usage, 200 gas and oil men from 11 states convened at Kingsville, Texas, May 27-30, for the second annual Gas Technology Short Course. Sponsored by the Southern Gas Association, the course was held under the direction of Dr. F. H. Dotterweich,

engineering department head at Texas A & I College.

Two caravans of automobiles made the trip to the citrus-growing Rio Grande Valley. One group visited the La Gloria Corp. cycling plant; the other the vast King Ranch at Raymondville, where registrants saw cereal grass dehydration plant of Evergreen Farms.

After re-grouping, the members visited two plants near McAllen. At Valley Vitamins Inc., they saw alfalfa being dehydrated and processed to supply carotene, chlorophyl, and xanthrophyl. At Universal Colloids, they viewed grapefruit peel being dehydrated in the production of pectinates for medicinal purposes.

More dehydration was demonstrated at the Texsun Citrus Exchange in Weslaco.

In general assemblies the men heard talks by J. A. Crichton of DeGolyer and MacNaughton, Dallas; Dr. Drew Mayfield, Celanese Corp., Bishop, Tex.; Captain E. S. Pettyjohn, director of the Institute of Gas Technology, Chicago; and R. M. Hutchison, research director, Houston Natural Gas Corp., Houston.

Chemicals being made at the Bishop plant of Celanese were discussed by Dr. Mayfield, who said that his corporation was the largest consumer in the country of acetic anhydride and acetic acid.

Captain Pettyjohn described research accomplished and in prospect at the Institute of Gas Technology.

A warning that American agriculture must cut out waste and seek more sources of income was voiced by Hutchison, who suggested more widespread conversion of lowly-rated raw materials into other products.

Specialized programs included sessions on utilization, production and transmission. A well-logging demonstration and a prediction of sub-surface gas flow by use of an electrolytic model table were other features.

Keeping Pace

New developments in gas equipment explained at Measurement Course

THE measurement and regulation of natural gas has become an exact science, speakers told the 800 registrants at the 1947 Southwestern Gas Measurement Short Course, held May 6-8 on the North Campus of the University of Oklahoma at Norman.

In 24 exhibits and 44 afternoon classes, it was demonstrated that gas appliance and equipment manufacturers have kept pace with the rapid growth of the gas industry.

Speakers before the general sessions included: R. M. Scofield, Lone Star Gas Co., Dallas, Texas, chairman of the General Committee; Dr. G. L. Cross, president, University of Oklahoma; W. H. Carson, Dean of the College of Engineering of the university; Ben F. Worley, United Gas Corp., Houston, Texas, 1947 chairman of the Committee on Practical Methods; E. F. Dawson, University of Oklahoma; Robert R. Suttle, Southern Gas Association; Kenneth R. D. Wolfe, Fisher Governor Co.; A. F. Benson, American Meter Co., Inc.; W. F. Lowe, Natural Gasoline Association of America; E. R. Gilmore, Pittsburgh Equitable Meter Div., Rockwell Manufacturing Co.; and D. A. Hulcy, president, Lone Star Gas Co., Dallas.

Mr. Hulcy declared that the natural gas industry has in recent years experienced the greatest growth and demand for its products and service in the history of this country. He declared that these demands pose great financing and construction problems. He predicted that shortages of gas experienced in some areas last winter may be repeated in the coming winter due to labor and material shortages.

E. C. McAninch, Oklahoma Natural Gas Co., Ardmore, who headed the program committee for the 1947 short course, was elected chairman of the general committee for 1948 to succeed R. M. Scofield.

Others elected to chairmanships on the general committee are: Dean Carson, Local Arrangements; C. E. Terrell, Southern Natural Gas Co., Birmingham, Ala., Program; Miss Kate A. Niblack, Oklahoma Utilities Association, Oklahoma City, Registration and Publicity; James L. Griffin, Northern Natural Gas Co., Omaha, Neb., chairman, and George E. Greiner, Phillips Petroleum Co., Bartlesville, Okla., vice-chairman, Practical Methods committee; Worley, Publications, and T. S. Whitis, Amarillo (Texas) Oil Co., Exhibits.

Winners of the prizes for writing the best papers on "What I Learned at the 1946 Gas Measurement Short Course" and the awards were: Roy A. Eaton, Continental Oil Co., Basile, Miss., first prize, $15; R. M. Van-Horn, Lone Star Gas Co., Dallas, second prize, $10: Homer Miesse, The Central West Utility Co., Bonner Springs, Kan.; Chas. G. Hurst, Arkansas Louisiana Gas Co., Little Rock, Ark.; C. O. Walling, Jr., Gulf Oil Corp., Crane, Texas; J. M. Brown, Lone Star Gas Co., Abilene, Texas, and Mrs. R. E. VanCleave, Cotton Valley, La., $5 each.

CALENDAR

July

Michigan Gas Association—Grand Hotel, Mackinac Island, Mich., July 7-8.

August

Appalachian Gas Measurement Short Course—West Virginia University, Morgantown, Aug. 25-27.

September

American Society of Mechanical Engineers, Fall Meeting—Salt Lake City, Utah, Sept. 1-4.

Mid-West Gas Association Annual Gas School and Conference—Ames, Iowa, Sept. 8-10.

New Jersey Gas Association — Stacy-Trent Hotel, Trenton, N. J., Sept. 23.

Pacific Coast Gas Association 1947 Convention—Coronado, Calif., Sept. 23-25.

October

American Gas Association Annual Convention—Cleveland, Ohio, Oct. 6-8.

National Safety Congress and Exposition—Chicago, Oct. 6-10.

National Metal Congress and Exposition—Amphitheater, Chicago, Oct. 20-24.

November

National Hotel Exposition — Grand Central Palace, New York, N. Y., Nov. 10-14.

December

American Society of Mechanical Engineers Annual Meeting — Dec. 1-5.

February, 1948

8th International Heating & Venting Exposition—Grand Central Palace, New York, N. Y., Feb. 2-6.

March

New England Gas Association—March 18-19.

Southern Gas Association—March 24-25.

Mid-West Regional Gas Sales Conference—Edgewater Beach Hotel, Chicago, March 29-31.

OTHER ASSOCIATIONS

Indiana Convention

Dr. M. O. Ross, president of Butler University, Grove Patterson, editor of the Toledo "Blade," and AGA President R. H. Hargrove led the parade

of speakers at the 37th annual convention of the Indiana Gas Association, held May 15 and 16 at French Lick Springs. Three hundred delegates attended.

Dr. Ross and Hargrove dwelt upon the importance of production and expansion by way of keynoting the convention theme, "The Blue Flame Is on the March." Ross stressed the need of maintaining a high level of production and employment in order to make free enterprise secure. Hargrove foresaw great expansion ahead in the industry itself.

Patterson spoke on Russia's foreign policy, as seen from personal on-the-spot observation.

New officers were elected, as presented elsewhere.

New API Awards

A series of awards designed to honor outstanding oil men for their contributions to the arts and sciences of petroleum production and use has been announced by the American Petroleum Institute.

Certificates of Merit will be awarded annually to those who have rendered extraordinary services as an officer or member of a division, committee or other organized unit of the Institute. Eight certificates may be presented each year: one each in the divisions of refining, transportation and marketing, two in the non-divisional committees and three for the division of production. These are in proportion to the numbers of persons serving in the various categories.

Presentations will be made at the annual meeting of the Institute.

The Certificates of Merit will be awarded in addition to the Institute's Gold Medal for Distinguished Achievement presented annually for outstanding contributions directly or indirectly to the petroleum industry.

Economy in Diesels

At a meeting of the American Public Power Association in Cleveland, Ohio, on May 22 Gordon Lefebvre, president and general manager of The Cooper-Bessemer Corp., Mount Vernon, Ohio, announced solution of an engineering problem that has been retarding the use of the gas-diesel engine in municipal power plants and other installations. The problem was that of obtaining fuel economy at light load as well as full load.

"Until recently," Lefebvre told the group, "the gas-diesel was very economical while running at full load, but it lost some of its efficiency at lighter loads and at extremely light loads became even less economical at times than the ordinary spark-ignited natural gas-burning engine."

Lefebvre predicted that solution of this problem would broaden the scope of gas-diesel use in many industries, particularly municipal power, sewage, and gas pipe lines.

Pennsylvania Meet

A three-day program which featured addresses by Louis Ruthenburg, Servel president, and authorities in the fields of production, distribution, accounting, customer and employee relations, and sales promotion rewarded members of the Pennsylvania Gas Association who attended the 39th annual meeting, held May 20-22 at Wernersville.

New officers elected, headed by James M. Huebner, vice president, Pennsylvania Light and Power Co., Lancaster, are listed elsewhere.

CNGA Frolic

Members and their guests gathered for the annual California Natural Gasoline Association's June Frolic June 7 at Rio Hondo Golf Club, Downey. Over 800 participated in the day's festivities.

The program began with a telegraphic "blind bogey" golf tournament with the NGAA in Tulsa which CNGA won.

At the monthly executive committee meeting, Frank J. Colton, superintendent of gas operation, Tide Water Associated Oil Co., was announced as the president for the year 1947-1948. Colton has been active in the affairs of the California Natural Gasoline Association since 1935, serving on such committees as the Fall Meeting, Technical, Program and Advisory, of which he was chairman for the past year. W. A. Kirk, Southern California Oil Co., was elected vice president.

New Officers of Three Associations

GAMA

THE list of new officers elected at GAMA's annual meeting in Chicago, April 14-16, to lead the association during 1947-48 is headed by John A. Robertshaw, president; Frank J. Hoenigmann, first vice president; Frank J. Nugent, second vice president, and John Van Norden, treasurer, as announced in the May issue of GAS. H. Leigh Whitelaw retains his post as secretary, and the following industry leaders were selected to head special projects and divisions:

Controls and Related Accessories Division—John A. Wolff, Milwaukee Gas Specialty Co.

Direct Heating Equipment Division — George H. McFadden, The Ohio Foundry & Manufacturing Co.

Domestic Gas Range Division—A. B. Ritzenthaler, The Tappan Stove Co.

Gas House Heating and Air Conditioning Equipment Division—C. B. Phillips, Surface Combustion Corp.

Gas Refrigerator Division—Louis Ruthenburg, Servel, Inc.

Gas Valve Division—R. L. O'Brien, Detroit Brass and Malleable Works.

Gas Water Heater Division—Frank J. Nugent, Rheem Manufacturing Co.

Hotel, Restaurant and Commercial Gas Equipment Division—W. H. Rudolph, Savory Equipment, Inc.

Industrial Gas Equipment Division — Herman Gehnrich, Jr., Gehnrich and Gehnrich, Inc.

"CP" Manufacturers Group — E. Carl Sorby, Geo. D. Roper Corp.

Gas Boiler Group—L. H. Hobson, General Electric Co.

Gas Conversion Burner Group—E. A. Weaver, Surface Combustion Corp.

Gas Furnace Group—Gene Brown, Morrison Steel Products Co.

Penn. Gas Assn.

New officers of the Pennsylvania Gas Association, elected at the annual convention May 20-22:

President — James M. Huebner, vice president, Pennsylvania Power & Light Co., Lancaster.

1st vice president — B. V. Pfeiffer, mgr., Gas Operations, The United Gas Improvement Co., Philadelphia.

2nd vice president — L. B. Richards, president, The Harrisburg Gas Co., Harrisburg.

3rd vice president — Andrew J. Leib, Mgr., Gas Dept., Luzerne County Gas & Electric Corp., Kingston.

Secretary — Wm. Naile, president, Lebanon Valley Gas Co., Lebanon.

Treasurer — James A. Schultz, asst. treas., Consumers Gas Co., Reading.

Indiana Gas Assn.

New officers of the Indiana Gas Association, elected at the annual convention May 15-16:

President — Dean T. Burns, assistant general manager, Citizens Gas & Coke Utility.

Vice president — L. B. Schiesz, president, Indiana Gas & Water Co., Inc.

Secretary-treasurer — C. W. Goris, Northern Indiana Public Service Co.

Directors — R. S. Brunner, Terre Haute Gas Co.; C. M. Cullison, Central Indiana Gas Co.; F. W. Dopke, Indiana Gas & Water Co., Inc.; and E. E. Linburg, Richmond Gas Corp.

EXPANSION

Inch Hearing

FPC to consider Texas Eastern plea July 7; New Allocations Made

HEARINGS on the application of Texas Eastern Transmission Corp. for a certificate of public convenience and necessity, authorizing operation of the Big and Little Big Inch lines for gas transmission and construction and operation of additional facilities, will get under way July 7, the FPC has announced. The company, which is to acquire the lines from the government next Nov. 25, is operating them at present under an interim lease from the War Assets Administration and a temporary certificate from the FPC.

Meanwhile, last month other developments were under way affecting allocation of gas and construction of additional facilities to boost future volumes.

New allocations, representing a substantial revision of past orders, were made by the FPC upon recommendation of the Industry Advisory Committee, and were arrived at following a conference called by the commission June 4. The principal question mark was equitable division between customers of Panhandle Eastern Pipe Line Co., serving the Midwest, and Appalachian suppliers. In effect, the new distribution setup boosted Columbia Gas System from 51.7 MMcf per day to 52.8, Consolidated Natural from 36.3 MMcf to 44, and Carnegie Natural from 1.5 MMcf to 2.2, and decreased sendout to United Natural and Equitable from 14.5 MMcf to 10 and 16 MMcf to 11, respectively.

Stated otherwise, the order gives Panhandle Eastern 20 MMcf and United Natural 10 MMcf; and, of the remainder, Columbia 48%; Consolidated, 40%; Equitable, 10%; and Carnegie, 2%.

FPC followed closely the recommendations of the committee. The Panhandle area will receive approximately 16% of the total of 140 MMcf now going into the lines.

New York State Natural Gas Corp. was authorized in a separate action to construct facilities to enable it to receive gas from the Big Inch at such time as delivery capacity of the Inches is increased, about Nov. 1. As approved by a temporary certificate, the company's proposed 6000-hp. compressor and 1.1 miles of 20-in. connecting lines, costing about $1.3 million, will permit taking of 75 MMcf.

The FPC also okayed construction by Texas Eastern of four compressor stations, one more than previously sanctioned. The overall capacity of the four will be 28,000 hp. and their cost is estimated at $3.5 million. They are designed to boost the lines' capacity to 265 MMcf per day by Nov. 1. Two will be of the blower type.

$1 Billion

In a roundup of utilities' expansion plans based on industry surveys, the AGA has come up with the following facts and figures:

Utilities are prepared to spend $1 billion for production, transmission, and distribution extension. Realization of this goal is being seriously hampered by material shortages.

Gas for househeating is wanted by 41% of the people.

Some of the programs of expansion:

Brooklyn Union Gas Co. has installed two new water gas sets, and has three more and a propane-air plant under construction. Two new waterless holders are also ready.

Boston Consolidated is building two carburetted water gas sets and will install a third. It plans an LP-gas plant with 28 storage tanks for standby.

Consolidated Gas Electric Light and Power Co., Baltimore, plans this year to match last year's 8 MMcf per day increase in manufacturing plant facilities. It is building a 5 MMcf holder, and will install an additional holder, two water gas sets, and other production facilities at a cost of $5.4 million.

Ohio Fuel Gas Co. plans on a $5 million outlay on its distribution system this year, and will spend $10 million on transmission and storage. Two propane-air plants are under way.

Portland (Ore.) Gas & Coke Co. will spend $3.25 million this year.

Many others were listed in the report, which stressed the fact that *there is no shortage of gas.*

Water Gas Machines

The continuing high demand for new gas production equipment is evident in the construction now being carried out for its customers by the Semet-Solvay Engineering Division of Semet-Solvay Co.

Within the next few months 15 additional Semet-Solvay water gas machines with backrun and three-way valves, and with a total rated capacity in excess of 66 MMcf of gas per day, are expected to be placed in operation in the following cities: Buffalo, N. Y.; Cedar Falls, Iowa; Derby, Conn.; Holyoke, Mass.; Miami Beach, Fla.; Pawtucket, R. I.; Poughkeepsie, N. Y.; St. Petersburg, Fla.; Taunton, Mass.; Toronto, Can.; Westfield, Mass.

All of the above installations are Semet-Solvay reverse flow machines, except one which is an ignition arch machine. Several have water cooled generators, one having the Type LR mechanical grate.

Gas For St. Paul Area

Northern Natural Gas Co. has been authorized by the FPC to construct facilities and sell natural gas to Northern States Power Co. for resale in St. Paul, South St. Paul, West St. Paul and Rosetown, Minn. St. Paul and environs are presently served with a mixture of natural and manufactured gas, purchased by Northern States from Koppers Co., Inc.

Although Northern Natural was previously authorized to increase its system capacity to 407 MMcf a day, the company expects to complete only 390 MMcf daily for the winter of 1947-48, which will do little more than serve present customers. FPC permission was granted upon the express condition that facilities authorized to serve the St. Paul area shall not go into operation until previously authorized facilities to increase Northern Natural's capacity have been completed.

Certificate Granted

The FPC has authorized Cities Service Gas Co. to construct and operate facilities intended to meet increased demands throughout the company's system, primarily in the Kansas City area. Representing the initial phase of a four-year construction program ultimately to increase the system's peak day sales capacity by 360 MMcf, the facilities authorized will increase the capacity on peak days by 237 MMcf. They will be constructed and in operation prior to the 1948-49 winter, the company estimates. This section of the expansion program will cost about $24 million.

Additional supplies needed to serve the new facilities will be drawn from gas underlying 300,000 acres of reserves in the Kansas-Hugoton field.

Coke Oven Gas Replaced

Following a hearing before the Public Service Commission of Utah, Mountain Fuel Supply Co., Salt Lake City, was ordered to extend its present gas system to the towns of Provo, Springville and Spanish Fork at the earliest possible moment, and to substitute natural gas for the coke oven gas previously served. The coke oven gas had been supplied by Columbia Steel Co. since 1931, but with the recent growth

of these three towns, due to operations of the Geneva Steel Co., Columbia Steel is now unable to furnish adequate supplies.

Service of natural gas will require an extension of approximately 38 miles of 10¾-in. pipe. Date of service will depend upon delivery of pipe, which at present is undetermined.

Construction Plans

Binghamton Gas Works has launched two projects to improve service in the area it serves. The firm will spend $737,000 this year to build new lines, replace old ones and add equipment to the subsidiary's system in the Triple Cities of Binghamton, Endicott and Johnson City, N. Y.

Included in the program will be the construction of a $140,000 feeder line from the subsidiary's trunk line at West Corners to Endicott. Balance of the money will be used to install new lines and regulator stations in the Binghamton-Port Dickinson area at points where there have been "weak spots" in the system. This is expected to overcome low pressure problems at many points.

The firm's second project includes enlargement of its propane plant so that it can provide half of the Triple Cities' gas needs for cooking and heating. Installation of 16 additional propane tanks, bringing the total to 28, is planned. Cost of the project will be about $164,000. Tanks now in place were installed last winter.

Switch to Water Gas

Contract for rebuilding 12 coking ovens and construction of 12 new ones for the plant of the gas department of the B. C. Electric Railway Co. at Vancouver, B. C., is under negotiation with Gas Chambers and Coke Ovens Ltd., London, England.

Work on construction will start almost immediately and should be completed by October, 1948. The development, which will entail expenditure of more than $700,000 in materials and labor costs, is part of a plan to change some of the gas production ovens over to carburetted water gas. Although the number of coking ovens will be reduced from 36 to 24, overall gas production will be increased by 4½ MMcf.

The new process will utilize all the coke produced and the company will discontinue sale of coke after June 30 when the new water gas plant comes into operation.

Denver Line Approved

Quick approval was given by the FPC late in May to the application of the Colorado Interstate Pipe Line Co.

to construct a pipe line, compressor station, and other facilities designed to increase the company's system capacity by 100 MMcf per day.

The application covered 240 miles of 20-in. line from Lakin, Kan., to Denver, Colo.; an 8400-hp. station and dehydrator plant at Lakin; 20 miles of 20-in. line for connection to the existing line near Denver; and 170 miles of gathering lines. The facilities will boost the capacity to 240 MMcf; next winter's peak day requirements are forecast at 208 MMcf.

Speed of the approval was laid to the seriousness of Denver's peak needs, lack of intervention, and possession of necessary pipe by the company.

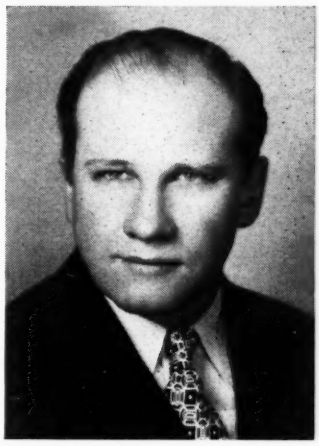
Gas Service Demanded

Claims of a large eastern Arkansas area for natural gas service were presented by Chairman Charles C. Wine of the Arkansas Public Service Commission at a meeting of the board of directors of Southern Union Gas Co. in Dallas early last month.

Southern Union is the parent company of Arkansas Western Gas Co. of Fayetteville, which has franchises for service in eastern Arkansas, an area "virtually without natural gas," Wine told the group. Lack of gas service has been emphasized by difficulty of getting gas across the Mississippi river from adjoining states, but recent authority granted to the Mississippi River Fuel Co. of St. Louis to double its line capacity, and probable permanent authorization of operation of the Big Inch and Little Inch lines across Arkansas from Texas gas fields have changed the picture. If the lines are going to traverse Arkansas, the state commission will seek to tap them for service, Wine said.

Republic Seeks Funds

The Republic Light, Heat & Power Co., Buffalo, N. Y., will buy additional gas and install new 6- and 8-in. lines to meet demands of customers in western New York if authority is granted by the Federal Securities & Exchange Commission to borrow $800,000 from Manufacturers & Traders Trust Co. Plans call for the installation of pipe lines to increase pressure, construction of pumping stations to maintain pressures, summer storage against winter demands, and an increase in purchases from its supplier, East Tennessee Pipe Line Co. The project is part of a three-year, $2.5 million expansion program.



Charles J. Morse, editor of "Gas News," the employee magazine of The Peoples Gas Light and Coke Co., Chicago, was elected president of the International Council of Industrial Editors at the organization's convention in St. Louis, Mo., on May 15.

The International Council of Industrial Editors consists of 30 editors' associations located in principal cities throughout the United States and Canada. Morse has just completed his term as president of the Editors Association of Chicago, and as first vice president of the International Council.

James T. Van Rensselaer of the Southern California Gas Co., Los Angeles, was elected Western vice president of the council.

Gas Cleaners Ordered

Northern Natural Gas Co. has placed an order with Blaw-Knox Co. for 25 gas cleaners, each 60 in. in diameter. Northern Natural obtains its gas from both Texas and Kansas and has lines in a half-dozen states. It recently filed an application to increase its natural gas transmission capacity to 580 MMcf per day.

The cleaners will be installed in the suction lines before the compressors to protect equipment from the wear and tear of solid particles and help insure a continuous flow of gas to the consumer.

Funds Requested

City commissioners of Clearwater, Fla., were recently asked to consider a request from City Manager Boyd Bennett for $25,000 worth of equipment for improvement of the gas plant. The appropriation would launch a postwar project to modernize the utility.

Gas For Rose City

Residents of Rose City, industrial suburb east of North Little Rock, Ark., will be served with a new 8-in. gas main as a result of completion of a new power plant by Arkansas Power and Light Co. in that vicinity. Natural gas from south Arkansas and north Louisiana fields is piped to the area through new mains laid last year by the Arkansas-Louisiana Gas Co., and is used by the new $3.5 million plant as fuel for power production. An additional mile of new main is being laid to make the same sources of supply available to domestic and industrial users in the vicinity of the power plant.

Rearrangement Approved

Permission to construct, acquire, rearrange, and operate facilities to be used in the transportation and sale of gas in West Virginia, Ohio, Pennsylvania, New York and Maryland has been given to Home Gas Co., The Manufacturers Light & Heat Co., Cumberland and Alleghany Gas Co. and Natural Gas Co. of West Virginia by the FPC. The rearrangement has been proposed to enable the companies more efficiently to meet peak requirements in the area.

The main construction authorized is a 130-mile, 14-in. line from Coatesville, Pa., to Port Jervis, N. Y. Estimated overall cost of the projects is $6,762,691.

Tank Outside City

Plans to locate a gas storage tank outside the city limits of Lakeland, Fla., have been announced by the Florida Power & Light Co. City commissioners approved the plan to extend lines to and from the tank, although their permission was not required, since it will be outside the city. The tank is needed to store gas during slack hours for use during peak consumption periods.

System Enlarged

An enlarged gas utility system began serving Tallahassee, Fla., customers last month when a new storage tank and improvements to installations at the gas plant were completed. The program cost $29,500. The tank, erected by the Chicago Bridge and Iron Co., is spherical, has 47,443 cu. ft. capacity, and is designed to carry up to 60 psi.

Gas For Mexico

Gas was scheduled to start flowing into the $4 million 151-mile pipe line linking the South Weslaco field of Hidalgo county, Texas, with industrial plants in Monterrey, Mexico, late in June. That forecast was made by officials of Reynosa Pipe Line Co., subsidiary of La Gloria Corp., Corpus Christi, which owns the four wells in the field.

Steam Boiler Ups Capacity

Tampa (Fla.) Gas Co. is expanding facilities to include a $35,000 steam boiler which will increase the steam generating capacity by 60% at its manufacturing plant at Second Ave. and 12th St. The boiler, which will be completed and ready for use in September, will be used as a reserve for the other two.

Shamrock Buys Sunray Plant

J. H. Dunn, president, Shamrock Oil & Gas Corp., recently announced purchase of Magnolia Petroleum Co.'s Sunray gasoline plant in Moore county, Texas. The plant is three miles south of Sunray and was built in 1937. Shamrock will install additional facilities to increase present capacity of 75 MMcf daily.

Service Extended

Natural gas began to flow into the mains of the Arkansas Western Gas Co. at Huntsville, Ark., on June 11. Huntsville is the first town to receive gas service under a new expansion program of the company, which will supply gas to Berryville, Harrison and several other towns from the company's Ozark, Ark., field.

New Distributor

The South Arkansas Gas Transport and Marketing Corp. has been organized in Magnolia, Ark., by R. G. Lawton, C. R. Cole and Edwin B. Keith. The firm will gather and distribute gas to Columbia county industrial users.

REGULATION

Withdrawal

FPC decides four natural gas cases are outside its jurisdiction

WHILE the gas industry has been busily engaged in trying to clip the Federal Power Commission's wings, the commission during the past six weeks has been renewing its efforts to prove the good faith behind its recent promises to apply the scissors itself. Late in May and early in June, FPC:

Disclaimed jurisdiction in the case of an application by Fin-Ker Oil and Gas Production Co. for a certificate of public convenience and necessity under the "Grandfather clause" of the Natural Gas Act.

Held that the operators of the Whelan Field, Texas, would be actually engaging only in production and gathering of gas, and sale at arm's length in their proposed scheme to sell gas to Texas Eastern Transmission Corp., and therefore would not become a natural gas company within the meaning of the act.

Found that gathering facilities purchased by Kansas-Nebraska Natural Gas Co., Inc., from Kansas Natural Gas, Inc., were currently being used as a part of its system and were therefore exempt from the provisions of the act. In addition, the operations of Kansas Natural previously held subject to commission rule have been discontinued, and that company is no longer subject to its jurisdiction, the FPC revealed.

Disavowed jurisdiction over natural gas rates and charges by the Chicago Corp. The ruling held that the firm is not a natural gas company according to the Natural Gas Act, and terminated a rate investigation launched against the company in 1944.

In its statement disclosing the findings in the Fin-Ker case, the commission went into detail to back up its stand that the opinion was "consistent" with previous rulings. "Where a person not otherwise subject to the jurisdiction of the commission is engaged in production or gathering of natural gas exclusive of its transportation in interstate commerce and makes arm's length sales and deliveries of natural gas in interstate commerce as an incident to or upon completion of that person's production or gathering, the provisions of the Natural Gas Act do not apply."

The commission cited past decisions, including the Interstate case, to prove its consistency. Differences in the Interstate case were pointed out.

On the basis of information presented by the Whelans, their transaction with Texas Eastern was viewed as an arm's-length sale.

In the Chicago Corp. case, investigation covered rates and charges for natural gas supplied to the Tennessee Gas & Transmission Co., controlled by Chicago Corp. as parent company at the time FPC launched its investigation.

The decision was based upon two factors:

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1. That at the time the basic contract was negotiated in August, 1943, no affiliation existed between the two companies and that the agreement when executed was an arm's length contract.

2. That although Chicago Corp. sells and delivers natural gas for resale to an interstate pipe line company for transportation and sale outside the state where it is produced, Chicago Corp. itself is exempt from the provisions of the Natural Gas Act.

It was explained that Chicago Corp. was the parent company of Tennessee Gas & Transmission at the time the rate proceedings were instituted and that it owned 81% of the voting stock, which it has since relinquished.

FPC Defines Scope

The FPC has taken another step to clear up the question of its alleged intent to broaden its jurisdiction to include gathering, producing, and processing gas per se. It has proposed adoption of a general rule to interpret its jurisdiction, to become Sec. 03.79 of Part 03 of Subchapter A, Chapter 1 of Title 18, Code of Federal Regulations, as follows:

"Section .03.79—*Production, Gathering and Transportation Defined and Distinguished.* (a) The Commission is of the opinion that the exemption contained in Section 1(b) of the Natural Gas Act, to the effect that the provisions of the Act shall not apply to the 'production or gathering' of natural gas, was intended by Congress to exempt from the jurisdiction of the Commission all activities in producing and gathering natural gas—including sales made at arm's length—by those who only produce, gather or process natural gas exclusive of its transportation and subsequent sale in interstate commerce.

"(b) To clarify further this determination and conclusion, the Commission adopts the following definitions:

"(1) 'Production' means the extraction of natural gas from wells or reservoirs and the recovery of residue gas from natural gas or casinghead (oil-well) gas by the removal of natural gasoline, propane, butane, or other hydrocarbons, and includes the arm's length sale of such natural or residue gas by the producer to a gatherer or transporter.

"(2) 'Gathering' means the collecting of natural gas from wells of the gatherer or of other producers, its movement to central points by means of pipe lines and other facilities used in connection therewith, its processing and compression as a part of gathering, and includes the arm's length sale and delivery of such natural gas by the gatherer, prior to the beginning of transporation in interstate commerce within the meaning of the Act.

"(3) As distinguished from gathering 'transportation' means the movement of natural gas, after its gathering, through pipe lines and related facilities transmitting natural gas in interstate commerce to the point or points of local distribution for ultimate public consumption, or, after the completion of gathering, to the point or points at which such gas is sold in interstate commerce for resale."

Gas in a fresh, modernistic setting is now served up to customers of the Portland Gas & Coke Co. at the company's new Albany, Ore., office. Designed by Portland's famed Pietro Belluschi, the new office features a "Hospitality House," combining a kitchen and small auditorium for meetings, classes, and demonstrations.

Conversion Banned

A damper on hopes of the Central New York Power Corp. to convert to straight natural gas was placed in May by the Public Service Commission of New York, when it directed the company to continue operating a manufactured gas plant—and, furthermore, that it boost the Btu content of the gas. This latter provision was aimed at increasing, in effect, the capacity of the plant, because the higher heating volume will enable customers to get along with smaller volumes, the commission said.

Reasons behind the action: to insure adequate gas supplies for residential and commercial consumers and to provide as nearly as possible the needs of industrial users next winter; and to make natural gas now being supplied to the company available in other areas of the state to relieve shortages.

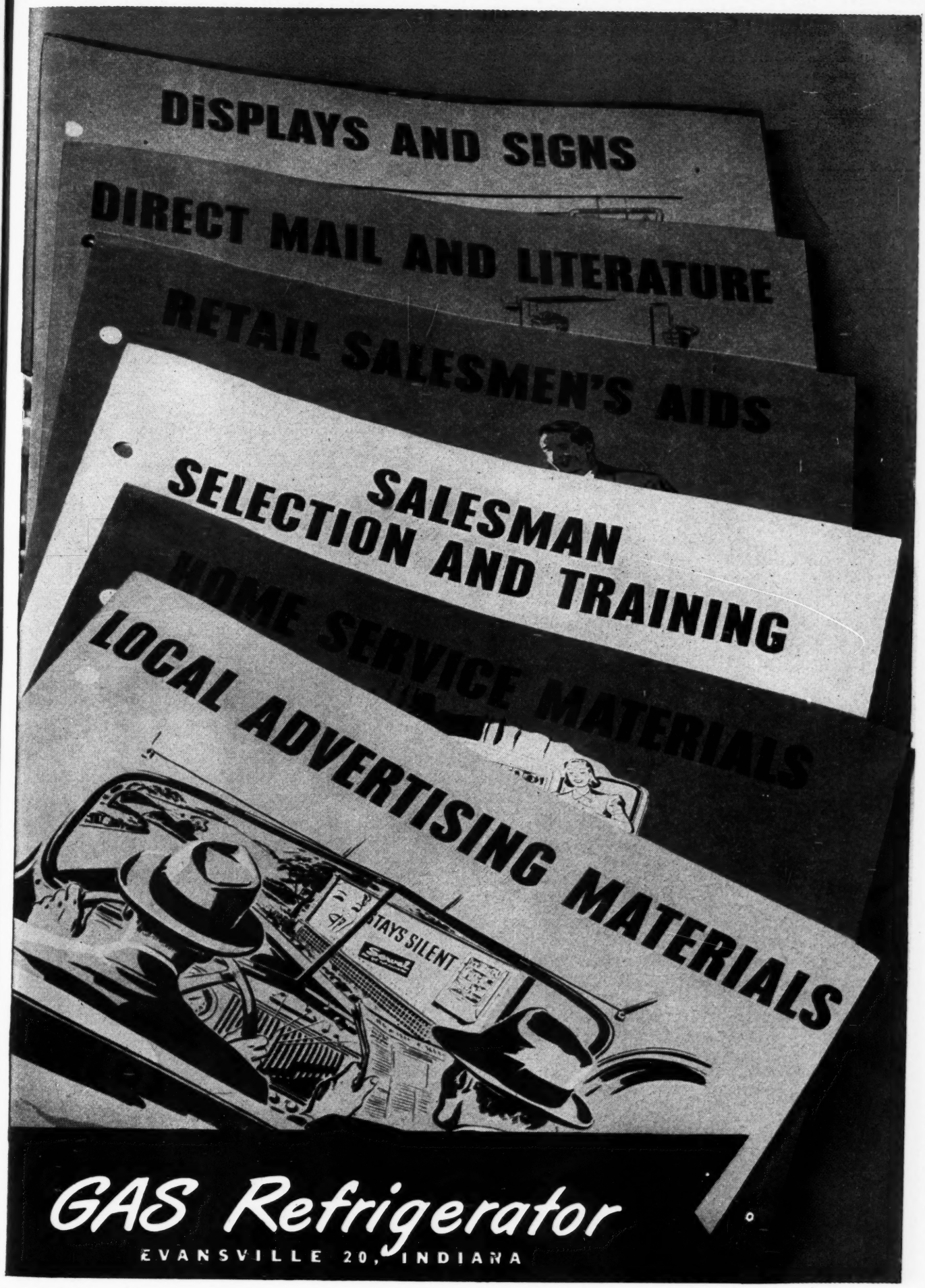
Right of Review Given

The New York Court of Appeals in May restored the right of utilities in that state to judicial review of property value for rate-making purposes as fixed by the Public Service Commission. The 4-3 decision was handed down favoring the Staten Island Edison Co., which alleged that the schedules fixed by the commission were so low as to be confiscatory.

Significance of the order is that it reversed previous administrative rulings which have held that commission orders are reviewable only through certiorari proceedings. In such cases courts are bound to accept the decisions of the commission if they are supported by substantial evidence. Commission counsel threatened to take the case to the Supreme Court.

Alabama-Tennessee

On the basis that the company contemplates a major change in its plans as set forth in the original application, the Federal Power Commission last month ordered that proceedings on the Alabama-Tennessee Natural Gas Co. petition be severed from those on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applications filed by Southern Natural Gas Co. and East Tennessee Gas Co. Hearing in the consolidated proceedings had opened May 26 in Chattanooga, Tenn.

FPC Staff Report

Two additional sections of the staff report on Docket No. G-580 of the Federal Power Commission have been made available to interested parties for comment. These sections are titled "Prospects for the Production of a Substitute for Natural Gas" and "Utilization of Natural Gas in the Development of Synthetics."

Five other sections of the staff report had previously been issued.

Gwinville Well Spacing

An order issued last August by the Mississippi Oil and Gas Board, which directed that gas wells in the Gwinville Field be spaced on the basis of one to every 320 acres, was upheld by the state's Supreme Court in May. The decision reversed a Hinds county circuit court ruling, which had favored Superior Oil Co. and other operators.

The order constitutes a compromise between operators on the one hand who sought a spacing of one well to 640 acres, and the land owners, who wanted one well per 160 acres.

The high court held that the circuit court was without jurisdiction as the appeal had not been made within the specified time limit.

FINANCIAL

Oklahoma Rate Cut

Annual gas rate reductions amounting to $193,200 for 14 cities and towns in northeastern Oklahoma, served by Gas Service Co. of Kansas City, have been approved by the Oklahoma Corporation Commision in line with cuts ordered by the Federal Power Commission. The FPC ordered a gas rate cut by Cities Service Co., of which Gas Service Co. is a subsidiary. Paul Reed, auditor for the Oklahome Corporation Commission, said customers in the cities and towns affected would also receive refunds on bills from 1943, totaling an estimated $700,000 to $800,000. The new rate is 50 cents for the first Mcf and 35 cents for each additional Mcf.

Allocations Set

Under a compromise agreement supported by preferred and common stockholders of Public Service Corp. of New Jersey, an amendment to the pending dissolution plan was filed with the SEC early last month, providing increased allocations of new $1.40 dividend preference stock to preferred stockholders. Under the new terms, allocations of the $1.40 dividend preference stock of Public Service Electric & Gas Co. would be as follows: For each share of 8% preferred, 4.7 shares; for each share of 7% preferred, 4.15 shares; for each share of 6% preferred, 3.7 and for each share of 5% preferred, 3.25 shares.

Sales Taxes Demanded

El Paso Natural Gas Co. has been directed by the Arizona state tax commission to pay $277,727 in unpaid sales taxes covering the period from Jan. 1, 1936 to the end of December, 1946. The order was the outgrowth of a hearing and is retroactive to the time when the company began to operate in Arizona.

In 1943 the company was notified to make a report to the commission, which it failed to do, contending that its sales in Arizona were not taxable because they were sales in interstate commerce. The firm announced that it will take the issue into the federal courts.

Rate Increase Asked

Winslow Gas Co. has petitioned the Arizona Corporation Commission for authority to increase its rates by approximately 18%. The petition will be the subject of a public hearing with the company basing its request on high labor costs, rail freight rates and general overhead expenses. Unless the petition is granted, the company said, this year's operations will show a loss.

Fuel Oil Prices Up

Socony-Vacuum Oil Co., Inc., increased its price of No. 5 and No. 6 heavy industrial fuel oil by 20 to 30 cents a barrel on June 17.

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2 | 4 OR 5 | 50
3 | 3 | 50
3 OR 4 | 4 OR 5 | 75
APPROVED BY
ROCKY MOUNTAIN GAS ASSOCIATION
DENVER MASTER PLUMBERS' ASSOCIATION
AND COLORADO MERCHANT MASTER PLUMBERS' ASSOCIATION
Jeffy Brite ©

Recently approved by the AGA, the Pacific Coast Gas Association's Water Heater Sizing Chart has now been adopted by Rocky Mountain Gas Association, through arrangement with PCGA. Retaining the red and blue color scheme, it is almost identical with original.

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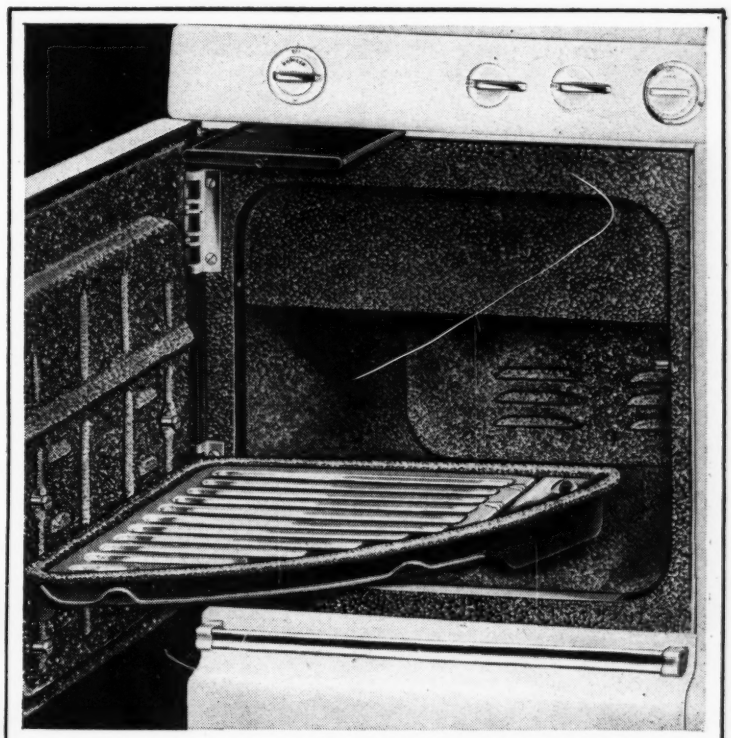
*Patents applied for



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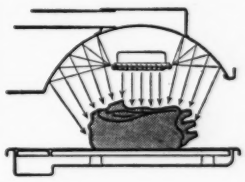

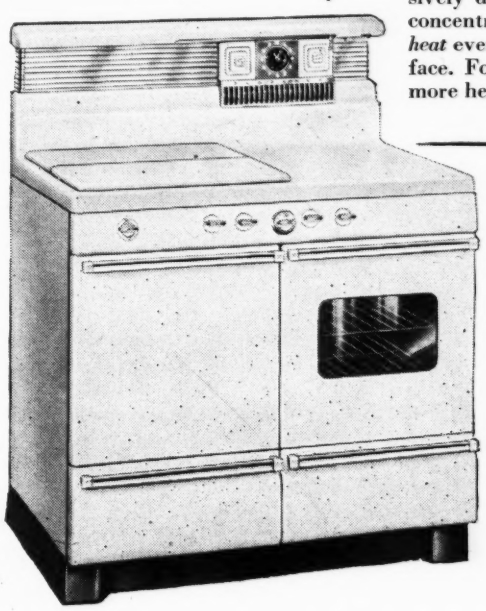

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GAS RANGES

FLORENCE STOVE COMPANY... General Sales Offices and Plant: Gardner, Mass. Western Sales Offices and Plant: Kankakee, Ill. Southern Plant: Lewisburg, Tenn. Other Sales Offices: One Park Avenue, N. Y.; 1459 Merchandise Mart, Chicago; 53 Alabama Street, S. W., Atlanta; 301 No. Market Street, Dallas.

Oxygen Gasification of Anthracite in Wellman-Galusha Producer

Abridgements of five papers presented at AGA Joint Production and Chemical Committee Conference, June 2-4.

THE following conclusions may be drawn from the results of oxygen gasification tests on rice and barley anthracite in the standard Wellman-Galusha producer at Trail, British Columbia.

(1) Rice size anthracite can be satisfactorily gasified in stationary fuel beds using oxygen and steam to yield high-quality gas suitable for use in ammonia, methanol or gasoline synthesis at gasification rates at least 100% higher than gasification rates for the same size fuel in the same producer when air and steam are used.

(2) Barley size anthracite can be satisfactorily gasified in stationary fuel beds using oxygen and steam to yield satisfactory synthesis gas at gasification rates at least as high as those normally attained in the same machine when rice-size fuel is used with air and steam. This represents considerably more than a 100% increase in capacity.

(3) The behavior of the ash from rice and barley anthracite in the oxygen-blown producer differs from the behavior of the ash from air-blown operations or from the ash produced in oxygen-blown operations using large-size coke in that it appears to be surface sintered, is more compact, and discharges with less motion of the grates. The grate spacing and eccentricity setting tested during studies on the oxygen gasification of rice size coal did not cover a wide enough range to permit continuous motion of the grates with this size of fuel. As a result, the grate failed to maintain the lower part of the fuel bed in slow, steady, but continuous movement—an essential requirement for good performance by a mechanical grate. Further experimental work is required to adapt the Galusha grate to oxygen-blown operations with rice coal.

(4) For operation with barley coal the grate spacing and eccentricity established during preliminary tests on oxygen-blown rice coal operations resulted in better ash removal and fuel bed conditions. The results are not fully conclusive, however, as gasification ratings were not carried to the maximum believed possible with the size of fuel.

(5) In all the oxygen gasification tests on anthracite, a considerable amount of manual work was required to break up ash-crust formations with bars driven through the poke holes. Satisfactory operation of the mechanical grate probably would eliminate a substantial part of this labor.

(6) The composition of the raw gas produced by the oxygen gasification of rice anthracite approached more closely the composition desired in purified synthesis gas than that reported for operations with large coke. Inert content was about the same while tars and condensable residues were not present in detectable amounts.

(7) The composition of the raw gas produced by the oxygen gasification of barley anthracite was not quite as satisfactory as that from rice coal, which may be due to inability to establish optimum operating conditions with the limited quantity of barley coal.

(8) Fuel gas with an average gross heating value of 305 Btu per cu. ft. was produced for one 7-hour test, using rice anthracite at a gasification rate of about 2750 lb. of fuel per hour.

(9) The coal consumption per Mcf of raw gas was, respectively, 23.2 and 25.9 lb. as fired for the oxygen gasification of rice and barley anthracite. The coal consumption per therm was, respectively, 8.55 and 9.73 lb. as fired for the rice and barley anthracite.

(10) Oxygen consumption per Mcf of raw gas and per lb. of fuel gasified was appreciably lower for rice size coal and slightly lower for barley coal than for large size coke at comparable ratings.

(11) Steam consumption per Mcf of raw gas and per lb. of fuel gasified was appreciably higher for both rice and barley coal than for large coke. The lbs. of steam decomposed per lb. of rice coal was, however, appreciably higher than for either barley coal or large coke at comparable ratings.

(12) From all the tests with anthracite, the refuse showed remarkably low loss of carbon, the percentage of carbon in the refuse in no case exceeding 3%. The results compare favorably with similar data for loss of carbon in the refuse from the oxygen gasification of large size coke.

C. C. WRIGHT[1] AND L. L. NEWMAN[2]

The [1]Pennsylvania State College Chief, [2]Bureau of Mines, U. S. Dept. of the Interior

Mechanical Dehydration

MECHANICAL treatment is a relatively new, successful method for dehydration of heavy oil tar emulsions. It employs centrifugal force, as imparted by a high speed centrifuge, first to destroy those internal forces causing emulsion stability, and second to rupture membrane boundary of the dispersed phase, viz., water. Coalescense and stratification due to differences in gravity cause so rapid a separation of phases that destruction of the emulsion is complete. Due to the presence of free carbon and coke breeze as suspensoid in tar emulsion, some provision for keeping the centrifuge free of this solid phase must be made. Earlier high speed machines, such as the Sharples Rotojector, were reported to have given excellent results regarding actual recovery of dry tar. However, the intermittent self-cleaning mechanism provided as an integral part of this equipment did not prevent frequent clogging of centrifuge bowl with solids, thereby necessitating shut down for cleaning. High operating cost and frequent interruption of tar processing made plant application of this equipment prohibitive. Certain mechanical design improvements have been made in recent years to overcome this serious limitation. Successful application has now been made in coal tar dehydration. Although similar in some respects, the dehydration of heavy oil tar emulsions by centrifuging incurred sufficient operating differences to warrant special development. To this end, the Brooklyn Union Gas Co., in cooperation with Sharples as centrifugal equipment manufacturer, has successfully conducted such a development program. This report presents plant operation data based upon the above work.

Mechanical dehydration of tar emulsion is today a complete and continuous process having an outstanding flexibility. Emulsions of widely varying water content and degree of stability can be handled within a fixed tar production schedule. Single units are available and rated at 800 gal. of dry tar per hour. Operation is automatic. Separator emulsion is preheated to 200° F and delivered at proper pressure to the system. Heating below boiling of water lowers emulsion viscosity and facilitates centrifuging as well as discharge of solids. A self-cleaning type Purolator filter removes particles 0.010 in. and over from the emulsion feed. Dry tar and water are readily recovered by the action of a high speed rotor and disc assembly, 6000 RPM, with a mean effective force equivalent to 8600 times gravity, while

tar solids and sludge are discharged through six carbolloy orifices, 0.035 in., set tangentially within the bowl periphery. This solid discharge is fed into the dry tar line while Purolator fines and water discharge are sent back to the separators.

Due to the purely physical nature of this method, dry tar so produced contains essentially all its light oil fractions. Also, since exposure to preheat is short, thickening processes are held at a minimum. Some heavy oil tar emulsions dehydrated mechanically have a viscosity 10% that of the heat treated. It is conceivable that besides simplifying plant handling, pumping, storage and shipment, such a tar would possess a higher sale value than viscous, still-cooked tar.

Compared with thermal dehydration, steam requirements for the mechanical method are considerably lower. This steam item, it will be recalled, constitutes the most important charge in operating the thermal method.

Features of plant compactness and fully automatic operation have a special appeal to works management today. General maintenance and supervision are low. A centrifugal unit has operated continuously for thirty days with good dehydrating results. However, a policy calling for periodic shut down for cleaning and general inspection after two weeks of continuous operation is better advised.

A. G. HALL and A. R. BAYER
Brooklyn Union Gas Co.

Selection of Coals for the Manufacture of Coke

THE 87 million tons of coal carbonized in by-product ovens in 1945 gave the yields[1] shown in *Table 1.*

Coke comprises about 70% by weight of the total products of coal carbonization. The most variable characteristic of the coals used is the coking property, and it is not surprising to find that coals for by-product oven use are selected primarily on the basis of coke quality and coke yields. By-product yields are important, but in general this factor is of secondary importance in coal selection except when it is necessary to choose between coals of similar coking properties.

It is impossible to generalize satisfactorily in the by-product yields obtainable from coal. This is because of the considerable range in chemical composition of the coals which are included in each of the classes which have been discussed, and because by-product yields are also dependent upon operating conditions. Furthermore, coals, even from the same mining district, may possess marked individualities.

The by-product yields obtainable from many coals and coal mixtures under particular operating conditions have been established by long use in a number of plants. In the case of unfamiliar coals, special methods have to be employed to determine the yields. Separate by-product recovery apparatus has sometimes been attached to single ovens located in the regular oven batteries of coke plants, but this method has not been much used.

Reference should be made to the "Survey of the Gas-, Coke-, and By-product-Making Properties of American Coals" being made by the Bureau of Mines. In this survey the yields of the products obtained from the carbonization of coal are reported for various carbonization temperatures. Data for 90 coals have been published and these constitute a valuable source of information concerning yields. A few concerns operating by-product coke oven plants have constructed apparatus to the specifications developed by the Bureau of Mines for the purpose of testing coals used in the plant or for investigating unknown coals.

The laboratory method for distillation of coal is still in use to determine yields of coke and by-products. The success of this empirical test depends upon the rigid control of test conditions by chemists experienced in this work and also upon frequent comparison of laboratory results with actual plant yields on the same coals. Koppers Co., Inc. and its predecessors have used this method, described by Rose[2], for 40 years.

CHARLES C. RUSSELL
Koppers Co., Inc., Kearney, N. J.

[1] De Carlo, J. A., Corgan, J. A., and Otero, M. M.: Coke and By Products in 1945. U. S. Bureau of Mines. Minerals Yearbook 1945 (1946).

[2] Rose, H. J.: A New Electric Furnace for the Determination of the By-Product Yields of Coal. Unpublished; Presented before Amer. Chem. Soc., Gas & Fuel Section, Pittsburgh. Sept. 7. (1922).

TABLE 1. BY-PRODUCTS OBTAINED FROM COKE OVEN OPERATIONS IN 1945

	Total Production	Average Yields Per Net Ton Coal
Coke Oven Gas		
Used in coke ovens	337,128,334 Mcf	
Used in steel or affiliated plants	324,294,221 Mcf	
Distributed through city mains	166,178,374 Mcf	
Used under boilers, etc.	32,061,903 Mcf	
Sold for industrial use	31,718,913 Mcf	
Wasted	13,094,363 Mcf	
Total gas produced	904,476,118 Mcf	10,330 cu. ft.
Tar	696,307,311 gal.	7.95 gal.
Light Oil (Crude)	245,687,253 gal.	2.84 gal.
Ammonium Sulfate (or Equivalent)	1,749,437,753 lb.	20.22 lb.

Future Gas Making Methods

THE outlook:

1. Future raw materials for the manufacture of gas in the northeastern quarter of the United States will continue to be chiefly bituminous coal and heavy fuel oil. Relatively small quantities of liquefied petroleum gases will be used for extreme peaks.

2. High-temperature carbonization of bituminous coal will continue to be carried out predominantly in large byproduct coke ovens. This process is now characterized by relatively high investment cost per unit of gas made, and by high operating credits from coke, tar, and other products which in toto exceed the value of the gas. Future technical developments to decrease gas costs will be along the following lines in order of their importance:

(a) New byproducts, and the upgrading and discovery of new uses for present products. Since operating credits from these sources now exceed that from gas it is obvious that any improvement here will be magnified when applied to the cost of gas. This will apply to

plants now in existence as well as to future plants. Most of the present scientific and technical research is being conducted along these lines, and some developments are now ready for commercial installation.

(b) Increasing capacity of present equipment. Some techniques are available today for small increases in capacity. No method is available today for large increase in capacity that would not affect the quality of the coke, which is the most important operating credit. There is no fundamental reason why some new discovery might not increase capacity without affecting quality of products.

(c) Increasing thermal efficiency. Thermal efficiency is now high, being about 90%, but the future should see some improvement.

(d) Cheaper plant construction. This is now being seriously studied and there should be some progress over the next several years, although other factors, such as plant life, and quality and yield of products, severely limit possibilities of improvement. Also installation of labor-saving devices may actually increase plant cost, but cut down overall costs.

3. Location of high-temperature carbonization plants near the point of gas consumption is more economical than their placement at the coal mine.

4. Low-temperature carbonization of coal is of no future interest in the manufacture of distributed gas, largely because of low operating credits as compared to high-temperature carbonization, as well as a low yield of gas.

5. The carburetted water-gas process, using predominantly coke and heavy fuel oil as raw materials, will remain as a maior method of manufacturing gas for many years to come. The most important potential improvement is an increase in the thermal efficiency, which will probably be accomplished by the use of oxygen, which can now be produced on a large scale at a reasonable price. This will also tend to increase the capacity of existing equipment, further lowering the cost of gas made by this method. But this use of oxygen will be possible only where relatively high load factors are involved.

6. Producer gas, because of its low heating value, has no place in the future of distributed gas, except for mixing purposes, despite high thermal efficiency and low cost of manufacture.

7. None of the processes for complete gasification of coal recently developed in Germany and elsewhere are suitable in their present state of development for the manufacture of city gas in this country. Developed primarily for making special gases for synthetic-oil manufacture, many of them are fundamentally unsound for city gas because of high investment and/or high operating costs, which even further research cannot correct. The most promising principle appears to be the complete gasification of powdered coal suspended in a stream of oxygen and steam, and preferably under high pressure to induce the synthesis of methane or other hydrocarbons within the generating chamber. Additional research and the expenditure of considerable sums of money will be required to evaluate completely this principle for possible manufacture of city gas.

8. Underground gasification of coal has little prospect of future use at all in this country due to the fact that savings of labor claimed in Europe would not apply in America. Under these circumstances transmission of the low-heating-value gas to distant cities is most definitely out of the picture.

9. Manufacture of oil gas exclusively from oil, despite the fact that heavy fuel oil will be only slightly higher in cost than coal on a therm basis, shows little promise of future application in the Northeastern United States because of high investment cost, low operating credits, and low thermal efficiency.

10. Refinery oil-gas, liquefied petroleum gases, and natural gas will, to a limited extent, be converted by reforming or be mixed to serve as a substitute for fuel oil for enrichment purposes, or to increase the capacity of water-gas plants during peak-load periods. This process will be limited to those localities where cheap and plentiful supplies of these hydrocarbon gases are available.

11. Manufacture of gas in combination with the manufacture of some other product, other than the high-temperature carbonization of coal, does not appear as of much promise for future cheaper production of distributed gas.

ALFRED R. POWELL
Koppers Co., Inc., Pittsburgh, Pa.

Water Gas Reactions

This report presents a summary of the experimental work done for the American Gas Association during the year ending June 20, 1946, which has been covered in the first twelve monthly progress reports to the Gas Production Research Committee. A review of experimental results was initially regarded as the primary purpose of the summary report, and the first draft was so written. As the material has passed through a considerable number of revisions, increasing emphasis has been placed on the development of methods of interpreting the experimental data and on the evaluation of the significance of the research with respect to other work, past or present.

A resume is presented of the information available in the literature on the fundamental characteristics of gasification reactions which are of direct interest to this project. Investigations of combustion and gasification reactions in fuel beds are reviewed with a discussion of the interpretation of the experimental results. The applicability of the results of fundamental research to operation of a water-gas generator is examined.

The pertinent data obtained at Battelle are reviewed and analyzed. Experimental work done can be summarized as follows:

1. A large number of exploratory tests were made in the experimental generator to obtain operating experience, to develop experimental techniques, and to determine the proper cycle for initial studies. Tests of a cycle using an air/steam ratio of 40:1 showed that this ratio was too low to maintain proper temperatures in the bed. A cycle using a ratio of 45:1 was selected on the basis of these preliminary tests.

2. Temperatures have been determined at five different levels of the bed throughout this cycle. The temperature pattern has been completely plotted. It is reproducible from cycle to cycle and test to test, and indicates reproducibility of other conditions in the generator.

3. Composition of the noncondensable gases in the bed has been determined at various levels and times during this cycle, and plotted to show the change in composition as the gases pass through the generator. A satisfactory technique of withdrawing samples from the bed for analysis has been established.

4. Methods of determining the steam content of gases in the bed have been studied intensively. Data on steam content have not been obtained because of lack of a satisfactory method, but prospects are good for obtaining this information with techniques now being investigated.

5. A stoichiometric unbalance among the gaseous constituents in the bed appears to have been recognized for the first time as a real phenomenon. This unbalance was accepted only after careful reviews of the accuracy of gas analysis methods.

JOHN F. FOSTER AND DONALD A. VORUM
Battelle Memorial Institute, Columbus, Ohio

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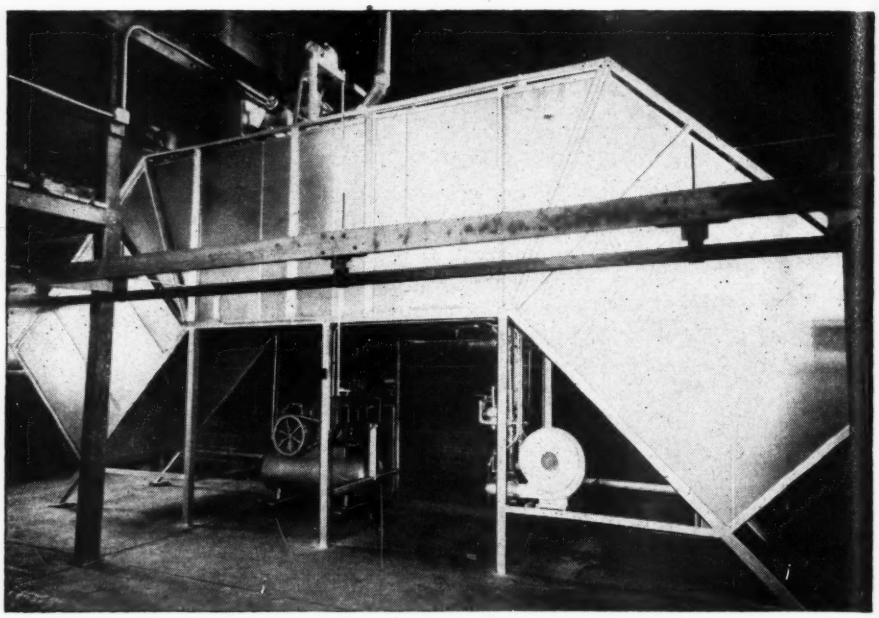


Infra-Red Burner

BURDETT MANUFACTURING CO., 3433 W. Madison St., Chicago, Ill.

MODEL: Gas-fired infra-red burn-off and rustproofing unit.

APPLICATION: For burn-off, rustproofing and degreasing.

DESCRIPTION: This unit is the result of continued experimenting with the Burdett infra-red gas-fired burner introduced a few years ago for drying, baking, cooking and many other heat processes. It was discovered that the burn-off process could be made to produce a rust-inhibiting surface superior to practically all existing rust-proofing methods, the manufacturer claims. Degreasing and rust-proofing are done simultaneously with a considerable saving in time, labor and equipment. Average time required for the entire operation is five minutes.

The process is said to depend upon the proper placing of the gas-fired infra-red burners in relation to the work, as determined by scientific standards. Not only are grease and similar film removed, but simultaneously a blue surface, which is extremely rust-resistant, is produced. This blue surface is explained as a tight scale and is said to reach hidden surfaces that are not ordinarily reached by rust-resistant liquids.

The company states that paint technician analysis proves that paint adhesion is equal or superior to that on surfaces treated with liquid rust preventives.

Heat Treating Machines

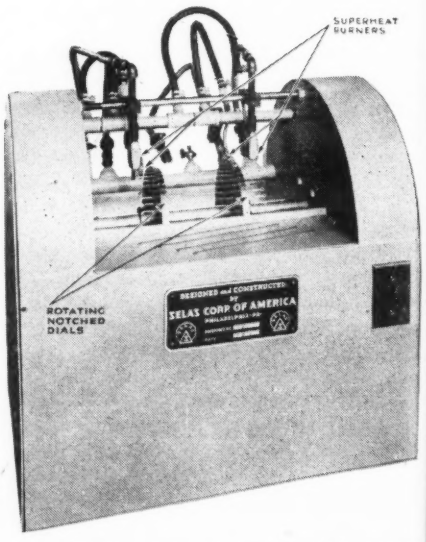
SELAS CORP. OF AMERICA, Philadelphia 34, Pa.

MODEL: Automatic Heat Treating Machine.

APPLICATION: For improved heat treatment of fragile assemblies weighing as little as a few ounces.

DESCRIPTION: Magnetic pull wires, used in business machines, furnish an example of how this closely controlled heat can produce superior results at a high production rate. These pull wire assemblies consist of two eyelets both welded to a connecting high-carbon steel wire. It is necessary to harden the eyelets for greater wear resistance and anneal the weldments to prevent breakage. Both objectives are accomplished with this automatic machine.

The assemblies are placed on a rotating drum and the eyelets are heated to hardening temperature by a set of staggered high-heat burners and quenched by a water spray attached to the side of the burner. A second set of burners anneals the weld and applies cooling water to the hardened eyelets so that they will not be annealed.



Production rate is about 1200 pieces per hour, manufacturing costs are lowered, and metallurgical results are claimed to be superior to any previously obtained.

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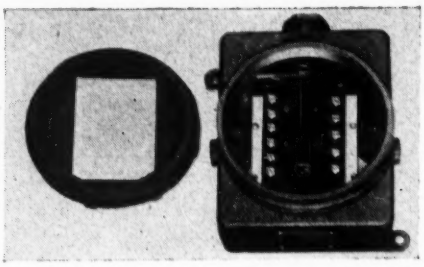


PHOTOSWITCH INC., 77 Broadway, Cambridge 42, Mass.

MODEL: Type 10CB1X.

APPLICATION: Designed for installation not only under normal industrial conditions but also under some of the most exacting conditions encountered in the chemical processing field.

DESCRIPTION: This device is an alternating current control that combines a probe circuit and transformer to operate a direct current relay, insuring heavy contact pressures and long relay life. Two probe rods are wired to the control project into the tank to the levels corresponding to the low point where pumping is to start, and the high point at which pumping stops. When the level of liquid falls below the lower probe, the level control closes the electrical circuit controlling the pump or valve. When the liquid rises to the level of the upper probe, the fluid acts as conductor of the minute current at low voltage required for the operation of the relay. Opening of the electrical circuit results, and pumping operations stop.

The explosion-proof housing, shown in the illustration, is used on installations where it is desirable that the level control which carries the current required to operate the pump be explosion-proof, even though it is permissible to pass a minute electrical current at low voltage through the liquid itself.

Contact with the liquid is made only by stainless steel probe rods. No floats or other moving parts are required in the tank, and no vacuum tubes are used. Accuracy is independent of temperature and pressure.

Soldering Set

IDEAL INDUSTRIES, INC., 2050 Park Ave., Sycamore, Ill.

MODEL: Ideal Thermo-Grip Soldering Set.

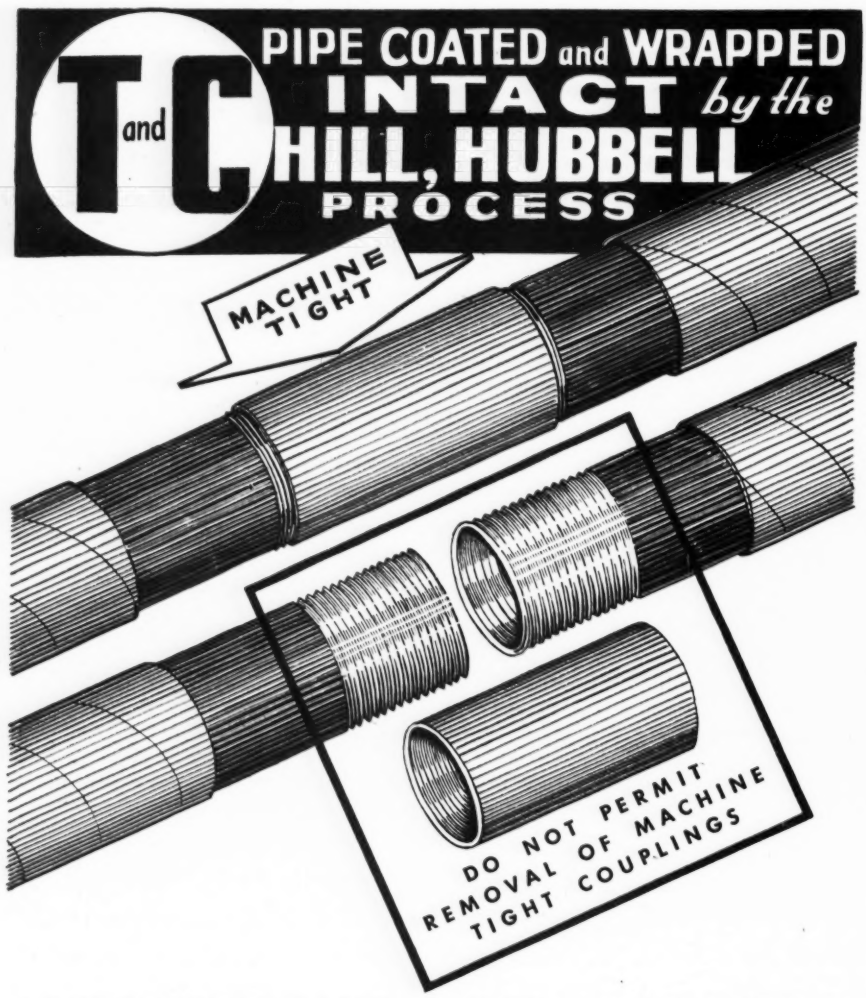
APPLICATION: Operating on the resistance heating principle, this redesigned model heats 20% faster, has a thumb switch for close heat control, is modern in design, lightweight, compact, portable and can be used for long periods of time without overheating. It is intended for work which may be held in the "jaws" and heated—for example, in removing or applying solder lugs up to 450 amps., sweating and unsweating copper pipe and fittings up to 1¼-in. diameter, soldering wire joints, etc.

DESCRIPTION: The complete unit includes a transformer or power unit and

a soldering tool that operates like a pair of pliers. Holding the work with the plier tool completes the transformer secondary circuit and causes the work to heat instantly, thus eliminating the need for preheating. Since heat is produced only between the electrodes of the soldering tool, concentrating it on the exact spot needed, there is no danger of melting nearby joints or burning other parts.

Handles of the plier tool are made of lightweight plastic. Radiating fins isolate the meehanite jaws from the handles to prevent excessive heat conduction. The plier can be locked in any position for special applications by tightening the screw at the hinge. Secondary leads, made of super flexible power cable and insulated with lightweight woven asbestos, are attached to the side of the jaw for easy handling and cooler operation.

The unit, rated at 1000 watts, measures 10¾ in. x 8 in. x 10⅜ in. overall. All parts tuck away in the streamlined case when not in use.



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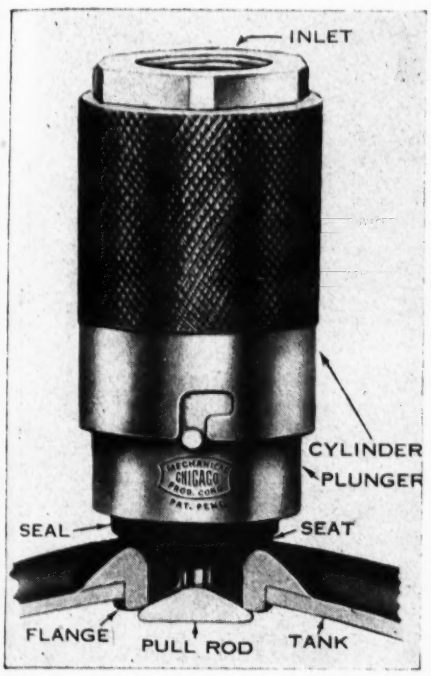
Filling Connector

MECHANICAL PRODUCTS CORP., 168 N. Ogden Ave., Chicago 7, Ill.

MODEL: Hydro-Matic Self-Sealing Filling Connector.

APPLICATION: For use by manufacturers of tanks, boilers, or other receptacles instantly to adapt air or liquid pressure lines to their products for making hydrostatic or pneumatic internal pressure tests.

DESCRIPTION: The time-saving advantage of this quick-detachable connector is emphasized by the one or two seconds required by this means of attaching or removing pressure lines to plain or threaded pipe openings. The self-sealing feature is accomplished by providing a greater pressure area against the plunger and seal than the back pressure area through tank opening, thus forcing and holding the seal firmly against its seat until pressure within the tank or vessel under test is released.



Hydro-Matic connectors are lightweight, rustproof and sturdily constructed for production line use under exacting standards of operation and safety. Standard sizes suitable for testing pressures up to 500 psi, made with ½, ¾ and 1-in. pipe inlets, and adaptable to ¾, 1 and 1¼-in. pipe openings, are available from stock. Other sizes are made to order.

Burner Heads

ANCHOR BURNER CO., 420 E. Grand, Oklahoma City, Okla.

MODEL: Air Cooled Burner Heads.

APPLICATION: Particularly adapted for use in floor furnaces.

DESCRIPTION: These burner heads have two air port openings which allow air to pass through, keeping the burner heads cool at all times to insure dependable, long life. They have been designed for easy adjustment to burn

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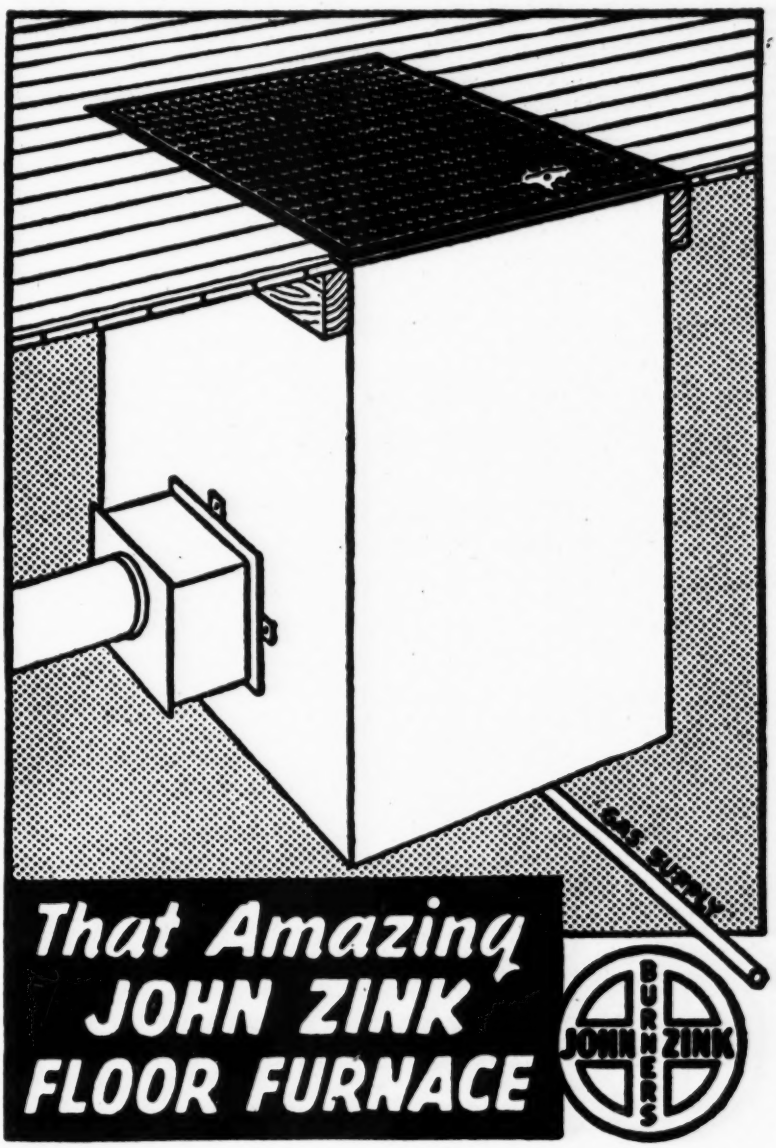

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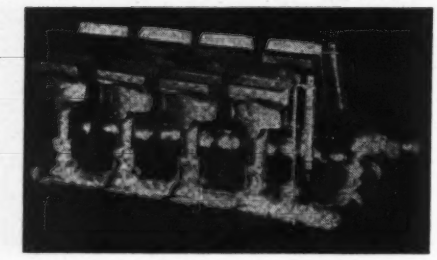


natural, butane, propane or manufactured gas. Changeover from one to another is made by replacement of small orifice section under the burner.

The burners come in single units with roomy, protected gas port openings which are difficult to clog or foul. They are designed to furnish an ample supply of fuel and an even steady flame. A reinforced throat provides abundant strength where needed. Twin-vents in the heads allow scale, rust and dirt to fall through harmlessly.

The gas and primary air strike the baffle or breaker plate and are thoroughly mixed in the chamber before reaching the point of combustion. Anchor burners are also available for oilfield uses, for all locomotive-type boilers, and for other purposes.

Anti-Corrosive Finish

THE WATSON-STANDARD CO., Industrial P-5 Division, Pittsburgh 12, Pa.

MODEL: P-5 Anti-Corrosive Co-Polymer Finish.

APPLICATION: Recommended for industrial use where protection against deterioration of surfaces is vital. It is applicable wherever a non-corrosive fast-drying finish is needed in steel plants, chemical plants, food packing houses, dairies, breweries, etc.

DESCRIPTION: This finish consists of a series of coatings for the protection of metal, wood and concrete against corrosion from exposure to moisture, acids, alkalies and other disintegrating elements. In addition to its chemical resistance, P-5 is free from objectionable paint odors, is non-toxic and dries by evaporation without requiring an oxidation period. It has good thermal stability and aging characteristics and is highly resistant to abrasion and scrubbing. It is claimed that P-5 does not oxidize or become brittle. It is available in nine colors.

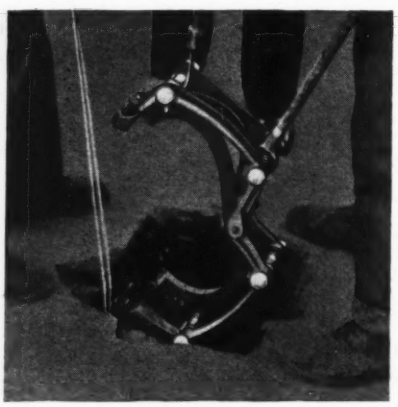
The high chemical resistance of the coating has been proved by tests in which films of P-5, .0025 in. thick, were immersed in various reagents for six months and found to be unaffected when removed.

NORMAC
BELL JOINT CLAMP

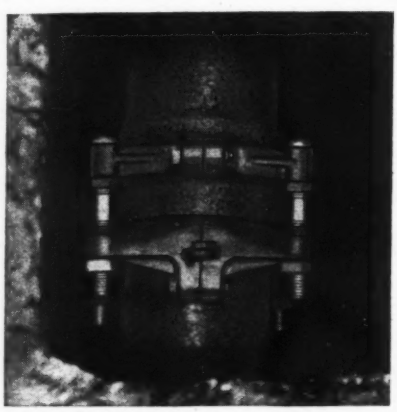
Solves Your Joint Repair Problems

- QUICK
- EASY
- PERMANENT

6 inch NORMAC clamp being lowered into hole for installation



6 inch NORMAC clamp in service after installation



Installed in pavement openings 1' x 1'. Available in all standard sizes from 3" to 12". A simple set of tools cleans the joint, installs the clamp... often in only a quarter of an hour. SAVES TIME. SAVES MONEY and the repair is permanent. Designed for all conditions particularly where pavement repair costs are prohibitive. Write for literature illustrating this simple solution to one of the Gas Industries most trying problems and ask for our catalog describing our complete line of

COUPLINGS... FITTINGS
SERVICE TEES and ELLS
SLEEVES ... COMPRESSION-END COCKS... COMPRESSION-END METER BARS

NORTON-McMURRAY MFG. CO.
39 SOUTH LA SALLE ST. ● CHICAGO 3, ILL.
Method and product covered by U. S. Patents, Nos. 2,163,261 and 2,178,286.

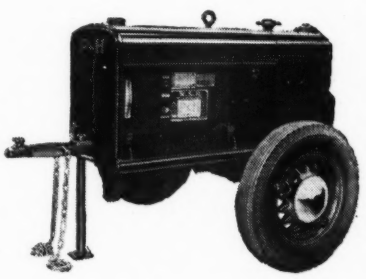
Portable Welder

HARNISCHFEGER CORP., 4400 W. National Ave., Milwaukee, Wis.

MODEL: WN-200 Welder.

APPLICATION: Built especially for field service; also useful in shop or yard.

DESCRIPTION: This trailer model is an NEMA rated machine of 200 amperes, but it has a welding service range of from 30 to 260 amperes. Engine and welder are securely mounted on an all-welded frame of steel tubing and heavy angle iron. Carried on a running gear of standard track width, the trailer welder has standard size pneumatic tires as regular equipment. There is an

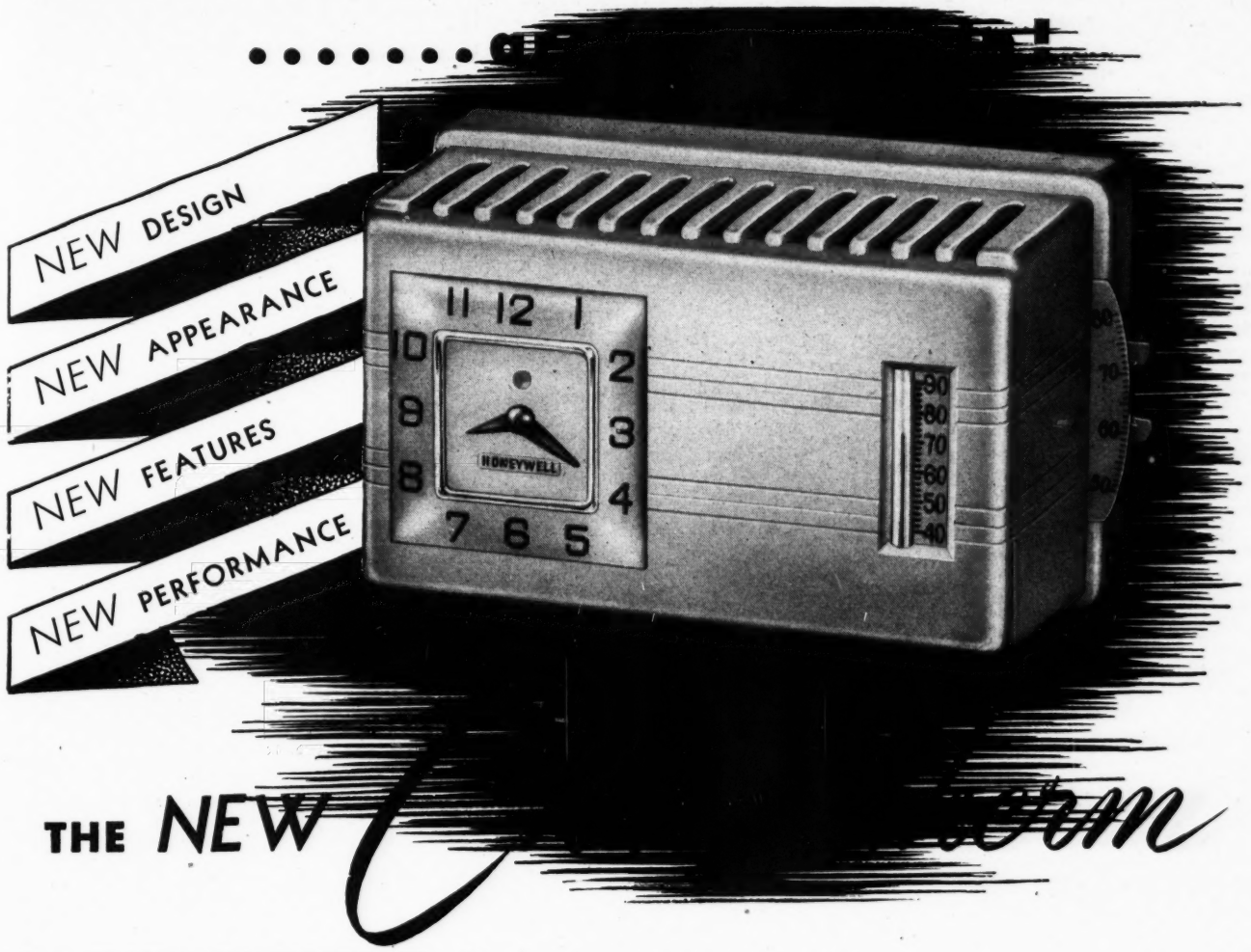


adjustable front end supporting stand for use when the welder is standing alone.

There is just one control for any desired welding heat from minimum to maximum capacity. Arc response is automatic on all classes of work and with all types of electrodes. "Visi-matic" calibration plates enable the operator to select instantly the exact welding current for each of the three classes of electrodes.

A heavy-duty, 4-cylinder air-cooled engine of 26.5 hp. supplies the power, and a 5-strand V belt is used for positive power transmission. Engine is rear-mounted for handy starting, and this also eliminates the need for unloading or unhitching before operation.

HONEYWELL CLOCK THERMOSTATS



THE NEW Chronotherm

Check these ten outstanding DESIGN FEATURES

1. Simplicity of overall design. No troublesome intricate mechanisms. Exceptionally compact.
2. New bimetal element . . . assures more accurate temperature control, yet sturdy and dependable.
3. Fingertip external adjustment for day-night temperature settings.
4. Gradual morning pickup insures accurate temperature being restored to the daytime setting without overshooting.
5. Ease of time settings for day and night operation.
6. External fingertip wheel for setting clock . . . hands may be set as easily as a watch.
7. Low speed clock motor . . . the ultimate in quiet, accurate clock operation.
8. Clock motor provides 30 times more power than required.
9. Easily removable clock assures ready means of replacement.
10. Separable wall plate for easy mounting.

Here's *BIG* news and it's *opportune!*

Once again Honeywell leads the way—this time with the entirely new Chronotherm, the finest electric clock thermostat ever built.

Never has there been such a timely opportunity to build profitable sales. The fuel saving feature of the Chronotherm creates an immediate demand in every market—new homes, conversion jobs, replacements.

Take advantage of this economical feature, and remember that the Chronotherm offers you *THREE TIMES* the usual profit of a manual thermostat sale. More profit for you — less fuel consumption and lower heating costs for your customers — these features make Chronotherm the natural sales leader of the year.

Backed by powerful national advertising that will stimulate interest and create public acceptance—also a complete merchandising plan for you—the Chronotherm offers an opportune sales advantage.

Place your order now through your usual source of supply.

Our salesmen will soon be demonstrating the merchandising plan we have prepared for you. Minneapolis-Honeywell, Minneapolis 8, Minnesota. In Canada: Toronto 12, Ontario.

DELIVERIES NOW BEING MADE TO YOUR SUPPLIERS

MINNEAPOLIS **Honeywell**
CONTROL SYSTEMS

Temperature Indicator

LEEDS & NORTHRUP CO., 4934 Stenton Ave., Philadelphia 44, Pa.

MODEL: Speedomax Indicator.

APPLICATION: For use where a large number of thermocouple temperatures must be logged in a short time.

DESCRIPTION: To read a temperature, the operator flips a key switch marked for the desired thermocouple; the instrument's drum scale spins and stops quickly and surely at the correct temperature. When logging temperatures, the limiting factor is the speed with which the operator can write down his readings. The indicator has high sensitivity and accuracy, even for low temperatures and short ranges. Wide markings make its scale easy to read.

Switching arrangements can be supplied to meet the needs of practically any application. A single instrument easily handles more than 100 thermocouples. Key switches can be color-coded for convenience in identifying points. Heart of the indicator's high-speed balancing mechanism is a Speedomax amplifier unit, which uses standard, easily-bought vacuum tubes.

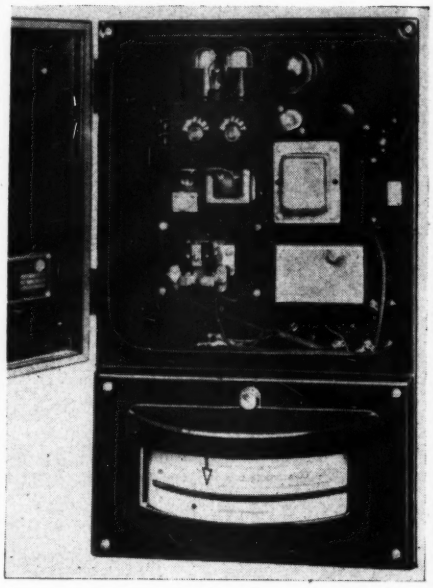
Temperature Control

CLAUD S. GORDON CO., 3000 S. Wallace St., Chicago, Ill.

MODEL: Xactline Capacitrol.

APPLICATION: For precision temperature-variation control.

DESCRIPTION: This new instrument combines in one complete unit the outstanding features of the Claud S. Gordon Co.'s Xactline control unit and the Wheelco Instrument Co.'s electronic principle Capacitrol. The features



which are brought together in the new Xactline Capacitrol are, for Xactline: the "anticipating" factor which holds temperature tolerances as close as 1/5° F plus or minus and power "on-off" cycles as short as 3 seconds; positive electrical action—no gears, cams, motors, bearings or other mechanical crutches; simple adjustment for wide range control requirements, and low initial cost plus low-cost operation.

For Capacitrol the features are: the electronic control principle, instantaneous control action, direct reading indicating scale, separately enclosed measuring instrument, and interchangeable unit construction.

Available in two distinct models for varying requirements. Flush or surface mounting case plus simple design and compactness make installation a matter of only a few minutes. Literature available upon request.

CORRECTION

The above item describing the "Xactline Capacitrol" is reprinted from the June issue of GAS, in which it appeared with the wrong illustration—a photo of the "Speedomax Indicator" which appears at the top of this page.

Back to Normal Line Maintenance

Proper maintenance of distribution mains of a dry-gas system is more necessary than ever. But you don't have to search for materials and manpower to keep your system at high operating efficiency. With "Carboseal" anti-leak your leakage problems can be overcome quickly and easily.

"Carboseal" anti-leak was specifically developed to overcome leakage due to dried-out jute and hemp packing in bell-and-spigot joints. Introduced into gas mains, it penetrates the dried-out packing fibers, causing them to swell and pack the bell tightly—preventing further leakage. "Carboseal" anti-leak is an effective, economical, and long-lasting means for improved maintenance which pays dividends in trouble-free distribution.

Get all the facts, then decide how "Carboseal" anti-leak can work for you as it has so successfully for hundreds of others. Write for booklet F-4506 which tells how "Carboseal" anti-leak is applied, how much it costs, and what results can be obtained.

CARBIDE AND CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

UCC

30 East 42nd Street, New York 17, N. Y.

CARBOSEAL ANTI-LEAK

"Carboseal" is a registered trade-mark of Carbide and Carbon Chemicals Corporation.

SALES SLANTS

Equitable Gas Tries Unique Good Will Plan

To promote customer good will and to keep the public informed as to what its gas company is doing, Equitable Gas Co., Pittsburgh, has under way a unique public relations campaign.

Customers are being notified of pipe line construction and equipment installations in their area by means of special two-color mailing cards informing them of the details of the work being done and how it will affect their service. Signs also are erected at each construction job, calling attention to the purpose of the construction. Six mailings have been completed, and a typical card reads as follows:

To Give You Better Service . . .

Equitable Gas Co. is constantly making improvements throughout its system in order to meet requirements resulting from the ever increasing use of gas in homes throughout the Pittsburgh District.

In your particular locality a larger main pipe line has been laid on Jacks Run Road between Bascom Street and Jacks Run Hill Road in Ross Township.

This installation will increase the assurance that you and your neighbors will have adequate, dependable gas service. It is our desire to provide you with such reliable service that you can obtain the maximum benefits from the use of natural gas for cooking, water heating, refrigeration and home heating.

Small LP-Gas Air Unit For Industrial Use Ready

Predictions of sharply accelerated use of LP-gas by industrial plants throughout the country plus new, broadened marketing opportunities for LP-gas bulk-plant operators were made recently by Harry W. Townsend, vice president, Pacific Gas Corp., specialists in liquefied petroleum gas marketing, engineering and utilization.

Industrial plants using gas in small quantities up to 500 cfh will soon be able to install low-priced LP-gas-fueled standby equipment, with fuel supplies maintained by truck deliveries, Townsend declared. A newly designed, packaged gas plant has been designed for small-consumption industrial plants and will enable a small industry to put itself on an equal footing with the big industries.

The new, small unit consists of a spherical container holding approximately 4300 gal. of LP-gas and a compact mixing and vaporizing unit about the size of an ordinary office filing cabinet. Manufacture of the gas-air machine is already under way. This installation should make possible wide acceptance of LP-gas, especially among those industrial plants where an uninterrupted supply of gas is vital. Such plants would include greenhouses, printers, chemical plants, tool shops, and all heat-treating processes.

ROBERTS' GAS APPLIANCES, INC., in cooperation with the gas appliance dealers of St. Louis, is sponsoring 15 minutes of entertainment and gas promotion Monday through Friday on KXOK. All commercials used promote gas appliances with heavy emphasis on the use of gas. Featured artists are "Singin' Sam," Charlie Magnante, accordion player, and his orchestra, and the Mullen Sisters.

BROOKLYN UNION GAS CO. officials recently attended the opening of a new store to be operated by Frank J. Keeley, as a special BU representative in the Greenpoint, N. Y., area. Keeley recently purchased the business of James G. Sutphin & Son, Inc., and completely remodeled the premises. A large window, attractively dressed with a Servel refrigerator, complete bathroom, and several other appliances, affords a view of the store's interior. The spacious store is decorated in a two-tone green color scheme, lighted with fluorescent lights, and features a complete New Freedom Gas Kitchen.

MULLINS MANUFACTURING CORP., Warren, Ohio, has issued a bulletin describing the patented Youngstown Kitchen Rule, a two-purpose device for simplifying the measuring of kitchens. It serves as an inside measuring rule and an equipment selector, making kitchen measuring a one-man, short-time job. It automatically measures in

IRON SPONGE over 72 years

First for Gas Purification

Extra high capacity and activity on first and repeated foulings . . . longer periods between necessary recoverings . . . fast "come back" after fouling . . . low initial cost . . . low maintenance . . . minimum operator attention. These are the advantages of Iron Sponge and the reasons why Iron Sponge has been the gas industry's choice as a purification material for over seventy-two years. With today's increased demands on gas producing facilities, such advantages as these are doubly important. Other Connelly products for the gas industry include:

CALOROPTIC. A simple, inexpensive instrument for continuous direct readings and control of BTU's applied to manufactured, natural, propane and butane air gas.

H_2S TESTER. For quick, accurate tests using pre-treated paper discs.

pH TEST KIT. A complete outfit for accurate pH determinations. Includes universal indicator solution, test tubes, color chart and full directions. A handy 3″ x 5″ pocket case holds the entire outfit.

Connelly engineers are prepared now, as always, to assist you with any problem in gas purification. Our files and laboratory facilities are at your service without obligation.

CONNELLY, Inc.

3154 S. California Ave., Chicago 8, Illinois
Elizabeth, N. J. • Los Angeles, Calif.

AMERICAN STOVE CO., in connection with a golden jubilee celebration at its Harvey, Ill., factory on May 10, offered to trade a new Magic Chef for the oldest Clark Jewel (former brand name) found operating and in good condition in the Chicago area. Mrs. Fred Bade of Harvey is shown above with her 1902 model which won the contest. In constant use for 45 years, the range has never required repairs or replacement of parts. Shown with Mrs. Bade are pensioners and long-time employees who remember when this range was "modern."

terms of actual size units. Illustrated instructions for using the rule are available from the company.

Another booklet, "General Plumbing Code Requirements," includes discussions on the sanitation features of Kitchenaider cabinet sinks, reasons for plumbing codes, and terms every dealer should know. Sketches of plumbing connections are also shown.

PHILLIPS PETROLEUM CO. has announced the transfer of its liquefied petroleum gas (Philgas) marketing organization from the research and development department to the sales department. K. W. Rugh will continue as manager of the Philgas division of the sales department. The transfer was made to consolidate the management of sales activities.

FLINT DISTRIBUTING CO., Salt Lake City, is sponsoring a cost-free speech development course for every employee of the firm, which distributes Bendix home appliances in Utah. The classes are conducted by Dr. Royal Garff, an authority on salesmanship and speech training. Two classes are held weekly, one for all employees and the other for the sales staff exclusively. Leland B. Flint, general manager of the concern, believes that "every employee is a salesman, regardless of his position." The speech development classes were inaugurated in September, 1946, and will be continued indefinitely.

DRESSER INDUSTRIES, INC., Cleveland, Ohio, has orders from the Russian government for eight deep-drilling rigs, 26 portable drilling rigs, 10 portable clean-out rigs, over 100 pumping units, a liquid methane plant, and various miscellaneous equipment. This announcement was made by J. B. O'Connor, executive vice president of Dresser, who recently returned to this country after eight weeks in Moscow negotiating the sale. O'Connor stated: "The Russian program of petroleum and gas rehabilitation and development, which is part of the current five-year plan, is a really stupendous undertaking."

THE G. S. BLODGETT CO., Burlington, Vt., has announced that all 22 models in its line of commercial, sectional gas-fired baking, roasting and general food cookery ovens are now available in #35 Monel metal. The exterior body, including legs, angles and drafthood, and all interior surfaces and parts subject to corrosion are of this metal. Monel construction is expected to satisfy the demand for good looking, as well as long-lived, equipment.

BROOKLYN UNION GAS CO.'s approved dealers are sold on the value of model kitchens as merchandising aids. Fifteen approved dealers now have attractive kitchens in their stores and are ready to plan and quote on them for customers.

THE ANSWER TO YOUR GAS ODORIZING PROBLEMS

Captan *Advantages*

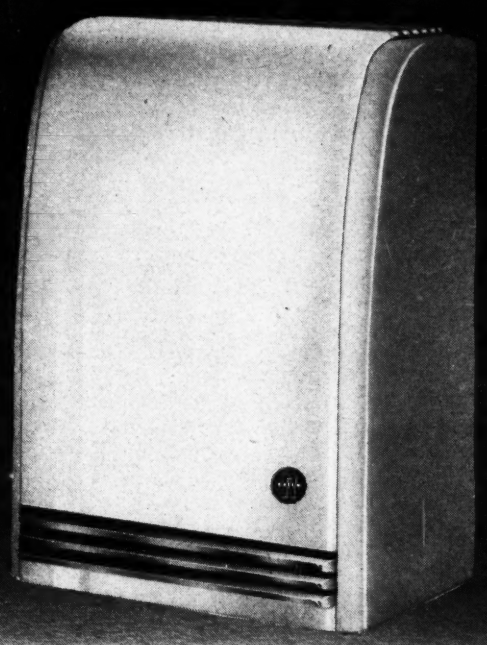
1 Gas-Like Smell
2 Available
3 Volatile
4 Harmless
5 Economical
6 Easy to Handle
7 Uniform
8 Doesn't Fade Out

NATURAL GAS ODORIZING CO., INC.
7620 WALLISVILLE ROAD
HOUSTON, TEXAS

ROBERTS & MANDER'S "Quality Kitchen," with gas range and a full line of modern steel cabinets, is one of the feature attractions of the "Village of Vision" at John Wanamaker's in New York. Seven full-sized, ready-to-live-in homes, together with an "appliance promenade," occupy an entire floor of the department store. More than one-half million people are expected to visit the display. A similar exhibit is being held in Wanamaker's Philadelphia store.

LET BEAUTY

BUILD [illegible] SALES



New RHEEM gas console heater

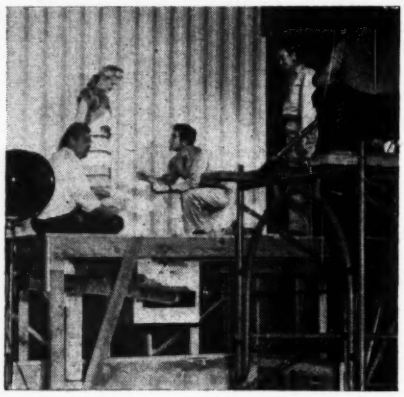
Women customers will like the simple gracious lines of this Rheem gas console heater. Its handsome antique finish brings new beauty to any interior. Tall functional design increases heat circulation and requires less floor space. Narrow base of heater permits installation on strip between wall and rug.

Sales are easy because the low price and economical operation fit any budget. Approved by American Gas Association, whether vented or unvented. Available in three popular sizes: 25,000; 35,000; 50,000 B.T.U. Get full information today. Write Rheem, 570 Lexington Avenue, New York 22, New York.

RHEEM... *making houses into homes*

RHEEM

PAYNE FURNACE CO., Beverly Hills, Calif., has constructed this unique set at Frederick K. Rockett Co. studios in Hollywood for the production of a series of sound-color slide films to be used as part of a training program for salesmen, installation men and dealers. "Star" of the films is the Payne gas floor furnace, and the elevated set enables the photographer to take shots both above and below the floor level. Titles of the series are "Sell 'Em Right," "Install 'Em Right" and "Control 'Em Right." A fourth film, in production at another studio, is called "Prospect 'Em Right."



ARCCO
SPECIFIC GRAVITY
DETERMINATION
OF
LIQUIDS
ARCCO-ANUBIS GRAVITOMETERS
• This Precision instrument indicates almost instantly and records continuously the Specific Gravity of liquids under actual line pressure. • The record made on the chart is automatically corrected to 60°F or other predetermined temperature. • Foreign liquids and gases are automatically purged. • There are no moving joints, stuffing boxes or other sources of leakage or friction in the Arcco-Anubis Liquid Gravitometer. • Hundreds are in continuous use in pipelines and refineries throughout the country.
Send for Bulletin No. 111-A
AMERICAN
RECORDING CHART CO.
3113 E. 11th Street • Los Angeles 23, California
SEND FOR BULLETIN NO. 111A

SAN FRANCISCO THEATERS, INC., have announced completion of the installation of interchangeable 16-mm and 35-mm film and sound equipment for screening of all types of non-theatrical motion pictures during week days from 8 A.M. to 5 P.M. at the Vogue Business Theater. The project began when a San Francisco wine company requested the use of the 375-seat theater for showing a documentary film to their sales executives. Investigation revealed that many businessmen had sought just such an opportunity to show 16-mm films with the advantages of theater seating, lighting and sound equipment.

CHASE COPPER & BRASS CO., Waterbury, Conn., has developed a bathtub, encased in four coils of copper tubing linked to the house radiant heating system. The tubing is covered with a 1-in. layer of cement plaster. Preheating the cold bathtub also helps heat the bathroom.

TAPPAN STOVE CO., Mansfield, Ohio, to assist its dealers with long-range promotional ideas, has issued a booklet titled "Tie to Tappan in '47," which outlines a complete merchandising program. A. L. Smith, district sales manager, points to one of the topics covered in the new portfolio, while Ross Sams looks on. Other Tappan representatives, left to right, are P. G. Andrews, A. M. Probst and E. T. Prendergast.

HOME SERVICE

THE GAS SERVICE CO., Kansas City, home service department, which started in 1928 with one member, has been enlarged by 25 new permanent employees and 25 college juniors who will work during the summer months as student apprentices, bringing the department total of permanently employed women to more than 55. The student apprentice plan was instituted last year with many valuable results. Not only did the students do worth-while work for the company during their apprenticeship, but many of them have returned after

graduation to become permanent members of the staff. Others recommended service with the gas company to their younger friends, and many more applications were received from juniors this year than can be accepted.

PEOPLES GAS LIGHT & COKE CO.'s test kitchen supervisor, Nellie Fredeen (seated), was presented with one of 12 honor awards distributed at a recent banquet by the home economics division of Michigan State College. The award, being admired by Sue Melter, a member of the home service office staff, is an inscribed bronze paperweight.

Miss Fredeen is reputed to be the first graduate from Michigan State to make home economics her chosen business career. The presentation was part of a two-day celebration given by the school in recognition of its 50 years of teaching home economics.

EQUITABLE GAS CO., The Manufacturers Light & Heat Co., and The Peoples Natural Gas Co. recently entertained 175 home economics teachers from Allegheny county (Pa.) junior and senior high schools and from colleges in the area at a dinner in the William Penn Hotel, Pittsburgh. Home service directors of the three gas companies—Kathryn Barnes, Equitable; Ruth Severson, Peoples Natural, and Flora Dowler, Manufacturers Light & Heat—served as hostesses.

Around the dining table were food displays, clock-controlled gas ranges, water heaters, automatic washers, gas clothes dryers, and Servel gas refrigerators. Dr. F. C. Blank, the H. J. Heinz Co. administrative fellow at Mellon Institute, Pittsburgh, took the home economists behind the scenes in glimpses of today's research to improve the nutritional value of foods. The current status of dehydrated and concentrated meats, fruits and vegetables, as well as frozen baked goods, was revealed. Miss Margaret Buchan, home economist of Kaufmann's department store housewares division, presented a display of the newest types of cooking utensils.

PEOPLE

C. F. WATERMAN, head of the plant accounting department of The Manufacturers Light and Heat Co., has been elected an assistant treasurer of the company. He will continue to make Pittsburgh his headquarters, where he will be in charge of rate analysis, property taxes and statistical reports.

R. CODY McPHERSON, former assistant manager, has been appointed general manager of Northwestern Utilities, Ltd., Edmonton, Alberta. The appointment was made at the recent annual meeting in Calgary. At the same time, annual meetings were held by Canadian Western Natural Gas, Light, Heat and Power Co., Ltd., and Canadian Utilities, Ltd. All three companies are subsidiaries of International Utilities Corp. F. A. BROWNIE, executive assistant to the president of Canadian Western, will continue in that capacity and will assume the post of general manager, according to an appointment made at the meeting. New Canadian Western directors elected at the conference were: E. W. BOWNESS, H. R. MILNER, P. D. MELLON, F. A. BROWNIE, F. A. SMITH, H. E. TIMMINS, A. G. BAALIM, D. K. YORATH and A. D. McNAB.

EYE APPEAL, ECONOMY, AND EXTRA FEATURES MAKE HAYLO THE SEASON'S BEST HEATER BUY

Attractive new styling and compact size make Haylo first choice for tasteful rooms and apartments.

Haylo Heaters can't rust or dent—they're high-pressure die-castings of special, heat-resistant aluminum alloy.

Rated at 6,000 BTU, approved by AGA for use with natural, manufactured, or L-P gas, Haylo Heaters are an ideal size for *recreation rooms, bathrooms, nurseries, playrooms, kitchens, small bedrooms, apartments, motels,* and *house trailers.* Compact, convenient size is 11½ inches high, 6½ inches wide, 12 inches long.

Haylo Heaters are now in production and available for early delivery. Write or wire for prices, discount schedules, and other specifications.

Haylo Heater shown in the "Postwar House" built by Fritz B. Burns Research Division

Heater Division
McCULLOCH MOTORS CORPORATION
6101 W. Century Blvd., Los Angeles 45, Calif.
Telephone: ORegon 8-2691

INSTALL UNDERGROUND LINES

FASTER—CHEAPER—

with an Earthworm

★

EARTHWORM

Features

- Save 50 to 90 percent in digging and repaving costs.
- Minimum manpower requirements—easily portable.
- Easily operated—straight line accuracy in boring to given point.
- Minimum street openings. Manual feed warns of underground existing lines.
- Quickly pays for itself—average boring speed, 1½ ft. per min.
- Complete unit—requires no auxiliary equipment.

Over 60 percent of our post-war production has been purchased by pre-war users.

3 Models — Write for delivery and operating instructions.

Mailing Address: BOX 1100

Earthworm

BORING MACHINE • MANUFACTURED BY LUBE JACK CO., SANTA MONICA, CALIF.

CLIP THIS AND MAIL TODAY

IF YOU ARE NOT A REGULAR SUBSCRIBER TO **GAS**

In GAS each month you will find dozens of ideas that will help you know your business better and do your job better. Just one of these ideas coming to you on our pages can pay you many, many times the small cost of a subscription.

GAS ... 1709 WEST EIGHTH ST., LOS ANGELES 14, CALIFORNIA

Please enter my subscription to GAS for ...

1 YEAR $2.00 ☐

☐ Check is enclosed ☐ Please bill me

NAME_____ POSITION_____

COMPANY_____

STREET CITY ZONE STATE

D. S. Reynolds

DAVID S. REYNOLDS, vice president and chief engineer of the Boston Consolidated Gas Co., was retired June 1. For many years he has been active as chairman or member of various committees of the AGA. He is president of the Guild of Gas Managers and in 1945-46 was president of the New England Gas Association. Reynolds entered the gas industry in 1902 as a draftsman with Boston Consolidated, a year before his graduation from Massachusetts Institute of Technology. He became chief draftsman in charge of drafting and designing, construction engineer in 1917 and, subsequently, manager of house heating, chief engineer, assistant treasurer and then a vice president.

GEORGE R. BROWN, chairman of the board, Texas Eastern Transmission Corp., announced recently that at a meeting of the stockholders held in Wilmington, Del., the following directors were elected for the ensuing year: AUGUST BELMONT and E. HOLLEY POE of New York City; CHARLES I. FRANCIS, HERMAN BROWN and GEORGE R. BROWN of Houston; E. DeGOLYER of Dallas; and R. H. HARGROVE of Shreveport. At a meeting of the board of directors, which followed, Hargrove was elected president and general manager and E. R. CUNNINGHAM, Shreveport, was chosen as vice president and operating manager. Francis was also elected a vice president. O. S. CARPENTER, formerly of Austin, Texas, is the new comptroller, and HERBERT J. FRENSLEY, Houston, was re-elected secretary-treasurer. Poe recently resigned as president of Texas Eastern because his own firm's expansions in geological surveys and activities for foreign pipe line construction occupy his full time.

C. A. Massa

CHARLES A. MASSA was elected treasurer of The Manufacturers Light and Heat Co. at a recent meeting of the board of directors. He has been senior assistant treasurer since November, 1946. Massa joined the Columbia System in 1930 as a rate engineer with headquarters in Columbus, Ohio. A few months later he moved to Pittsburgh in the same capacity. In June, 1935, Massa became tax agent and chief statistician for The Pittsburgh Group of the Columbia companies, of which The Manufacturers Light and Heat Co. is a part. He will continue to make Pittsburgh his headquarters.

CLARENCE A. WARDEN, JR., executive vice president of Superior Tube Co., was elected a director of The United Gas Improvement Co. at a meeting of the board of directors held May 27.

M. J. Vollmer

M. J. VOLLMER, assistant secretary and assistant treasurer, A. O. Smith Corp., Milwaukee, was elected a director at the quarterly meeting of the board held June 5. He replaces JOHN LEEKLEY, who resigned. Vollmer joined the company in 1929 in the automotive sales division. After spending some time in budgeting and time study, he became special assistant to W. C. HEATH, who was then vice president. Vollmer worked in factory management, helped to establish a controller's office, and in 1939 resumed his post as assistant to Heath, who was then president. In 1945 Vollmer was appointed to his present position.

CHARLES F. WILSON, Lone Star Gas Co.'s superintendent of stores, was elected general chairman of the Public Utilities Group of the National Association of Purchasing Agents at the convention in New York, June 2-4. Formerly vice chairman of the utilities group, Wilson is also president of the Dallas Association of Purchasing Agents. His new duties will include supervision of all publications for the association which have to do with public utilities, and supervision of group activities such as program planning, executive committee meetings, etc.

B. A. Johnson

B. A. JOHNSON, who recently resigned from Minneapolis-Honeywell Regulator Co., has moved to Chicago to work in an administrative and consulting capacity. Prior to joining Honeywell in 1942, Johnson was associated with The Peoples Gas Light & Coke Co. He left to work in a Honeywell-operated Chicago war plant, became its chief engineer, and after V-J Day moved to Minneapolis to become assistant to the engineering vice-president. His new association will be with Barney Olson, Inc., and Condensation Engineering Corp., both located in the Peoples Gas Bldg., Chicago.

A. B. RITZENTHALER, vice president in charge of sales of the Tappan Stove Co., Mansfield, Ohio, was one of three persons recently elected to serve on the board of directors, according to Alan P. Tappan, president. The other two members are WILLIAM R. MABEE, plant superintendent, and HAROLD O. DYSART, secretary. Ritzenthaler has been with the company 21 years, Mabee, 20, and Dysart, 25.

GEORGE H. BROMBERG has been named advertising and sales promotion manager for the Chicago branch of Bendix Home Appliances, Inc. He had been research director, merchandising and sales promotion manager for Weiss & Geller Advertising Agency, Chicago.

HARRY L. FARRAR, president, Coast Counties Gas and Electric Co., San Francisco, has announced that the following are the new titles and addresses of company executives and supervisors. Coast and Valley Region, Santa Cruz, Calif.—A. E. STRONG, manager; F. S. THOMAS, assistant manager; LOUIS WOLLENBERGER, sales supervisor. Watsonville District—C. R. HAYDEN, manager. Valley District, Los Banos, Calif.—W. A. McCANDLESS, manager. Contra Costa Region, Concord, Calif.—R. L. HAYDEN, manager; J. G. McKINLEY, sales supervisor. Martinez District—G. H. LOOSMORE, manager. Pittsburgh District—J. G. FOSTER, manager. Walnut Creek District—G. H. CONNER, manager. Rodeo District—E. C. STANLEY, manager. Vice President H. W. EDMUND has moved from Santa Cruz to the San Francisco office.

J. J. Manning

JAMES J. MANNING has been appointed New England division sales manager for the Florence Stove Co., Gardner, Mass., according to an announcement by Robert H. Taylor, new vice president. Manning has been territory salesman, wholesale manager, and district sales manager for prominent appliance distributors in the New England area. He has also specialized in retail dealer and retail salesmen's training programs. He will make his headquarters at Gardner.

LIQUEFIED PETROLEUM GAS KEY TO SUCCESSFUL SMALL CITY GAS PLANT OPERATION

Now is the time to convert your gas distribution system to Liquefied Petroleum Gas for lower fuel costs, less maintenance and uninterrupted service to your customers.

The small additional plant investment and a minimum of labor, repairs and replacements combine to provide profitable operation.

For information about conversion to Liquefied Petroleum Gas, contact your nearest Warren office.

"1922-Silver Anniversary Year-1947"

WARREN PETROLEUM CORPORATION
TULSA, OKLAHOMA
Detroit Mobile Houston

The Inland Door Closer

DESIGNED for CONVERSION BURNERS

OVER 50,000 IN USE

This device, designed for conversion burners, automaticallly closes the fire door of a boiler or furnace when blown open.

It consists of a cadmium plated door hinge pin, spring and wedge. The hinge pin replaces the regular fire door pins, the spring furnishes the motive power and the slotted wedge holds the fire door in the open position when required.

Furnished in 3/16 — 1/4 — 5/16 — 3/8" Sizes

INLAND MANUFACTURING CO.
1120 N. Cicero Avenue, Chicago, Ill.

THE WELSBACH CORPORATION

UTILITY MANAGEMENT

CONSTRUCTION

STREET LIGHTING MAINTENANCE

WELSBACH

consultants on all phases of utility operation

1500 Walnut St., Philadelphia 2

HARRY WARNER, secretary-treasurer and a director of The Gas Service Co., Kansas City, is retiring from the organization. His resignation was accepted by the board of directors at its meeting on May 27. The following new officers were elected at the meeting: R. M. POWER, promoted from rate engineer to first vice president and director; T. J. STRICKLER, vice president in charge of Kansas City, Mo., operations; C. H. WARING, vice president in charge of Kansas City, Kan., operations; JAMES R. ABERCROMBIE, treasurer; IRA W. McKEE, secretary; RALPH A. BARKER, assistant secretary and treasurer; and ARTHUR F. ANDERSON, assistant secretary and treasurer. BEN C. ADAMS, president and general manager, announced at the meeting the appointment of CHARLES H. KOINM as assistant to the general manager. Koinm has been general superintendent of the company.

R. M. Jernstrom

REGINA M. JERNSTROM has been appointed home service director for District 6 of The Manufacturers Light and Heat Co., replacing Evelyn M. Porter. Miss Jernstrom graduated from Mt. Mercy College, Pittsburgh, and has taken graduate work at the Universities of Wisconsin and Pittsburgh. She taught classes in food preparation and clothing design as a home economics instructor in the Pittsburgh school system and served as a home service representative in Pittsburgh for Equitable Gas Co. From her headquarters in Uniontown, Pa., Miss Jernstrom will conduct home service activities in a number of surrounding communities.

REESE B. LLOYD is Rheem Manufacturing Co.'s new manager of western plants, with headquarters in Los Angeles. He joined Rheem in 1944 and for the past year has been manager of the larger of the firm's two Chicago plants. R. J. SELTZER, for four years manager of the Sparrows Point, Md., plant, has been appointed manager of the company's eastern plants. He joined Rheem in 1938. C. THOMAS MILLER has been named eastern regional manager of appliance sales, replacing W. W. STEVENS, who resigned. Miller has served the firm in various sales capacities since 1942.

ALFRED D. HOWARD, former assistant sales promotion manager of Servel, Inc., has been appointed assistant general sales manager of Kaiser Fleetwings Sales Corp., Oakland, Calif., and Bristol, Pa. S. D. Hackley, Kaiser vice president and general manager, announced that Howard was selected to assist PAUL L. YAGER, general sales manager, in marketing the new Kaiser dishwasher.

WILLIAM W. STEVENS, formerly eastern regional manager of appliance sales for Rheem Manufacturing Co., has joined the Lawson Manufacturing Co., Pittsburgh, as general sales manager. Stevens was chief expediter for Rheem during the war.

Reynolds

for Gas Control

FOR OVER FIFTY YEARS, Reynolds Gas Regulators have proven their ability in a field outstanding for its rigid requirements.

Proper regulation at the station; in the line; in industrial plants; in the home—for every kind and type pressure control equipment used in the gas industry, there is an especially designed product by Reynolds. Right down the line! From High Pressure to Low Pressure, from one ton to inches W. C., on big jobs or little jobs, one of the Regulators listed below will do a better job on your gas control.

REYNOLDS PRODUCTS

High Pressure Service House Regulators
Straight Lever Type—Model 10-20 Series.
Toggle Lever Type—Model 30 Series.

Low Pressure Service or Appliance Regulators

District Station Regulators
Single or Double Valve, Auxiliary Bowl and Automatic Loading Device Optional.

High Pressure Line Regulators
Pilot Loaded—Pilot Controlled

Toggle Type Regulators
Single Valve, Double Valve, Triple Outlet.

Seals: Dead Weight or Mercury

Relief Valves: High or Low Pressure

Back Pressure Valves
Automatic Quick-Closing, Anti-Vacuum Valves.

Automatic Shut-off Valves • Vacuum Regulators
Lever Operated Valves • Louver Operated Device
Atmospheric Regulators

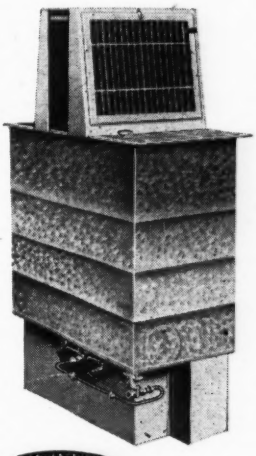
GAS CONTROL SINCE 1892

REYNOLDS GAS REGULATOR CO.
ANDERSON, INDIANA, U. S. A.

including BETTER HEATING!

Because there *are* two sides to the Pacific Dual Register Floor Furnace story, homes are heated better. Easily installed in wall, the Dual Register services rooms on either or both sides of wall. With all the engineering features that made the Pacific Floor Furnace nationally recognized, the Dual Register Furnace is helping further Pacific's third-of-a-century reputation for outstanding gas heating engineering.

Features include exclusive multi-tubular burner, famous Pacific heating element with efficiently contoured warm air passages, choice of controls and of sizes. Fully vented—no clammy walls or stuffy rooms.



A long-established, proven money-maker is the entire Pacific lineup of gas heating equipment—now includes Vented Console Heaters, Floor and Dual Register Furnaces, Winter Air Conditioners, Gravity Furnaces, Suspended Units and Duct Furnaces. Investigate the dealer franchise opportunities in your community for this pioneer Western firm of gas heating experts. Write today for full particulars.

Gas Heating Specialists for more than a third-of-a-century

PACIFIC

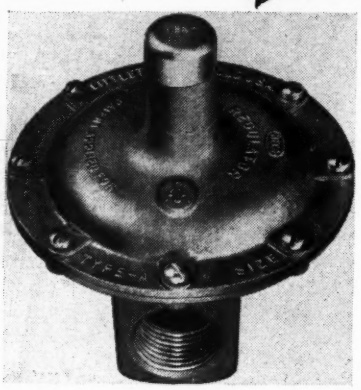
Pacific Heater Division
NACO MANUFACTURING CO.
P. O. Box 310, Huntington Park, California

HECO'S *New* PRECISION DIE-CAST Gas Appliance REGULATOR

Designed, engineered and produced complete by Heco, units are individually tested to assure close control at minimum maintenance cost.

Available for Immediate Delivery

- PRESSURE DIE-CAST FROM FINEST ALUMINUM ALLOY
- BRASS-TO-BRASS SEAT
- CORROSION-RESISTANT INTERNAL PARTS
- LOWER SHIPPING COSTS
- CLOSE CONTROL
- HIGH CAPACITY
- LOW MAINTENANCE
- INDIVIDUALLY TESTED
- APPROVED BY A. G. A.

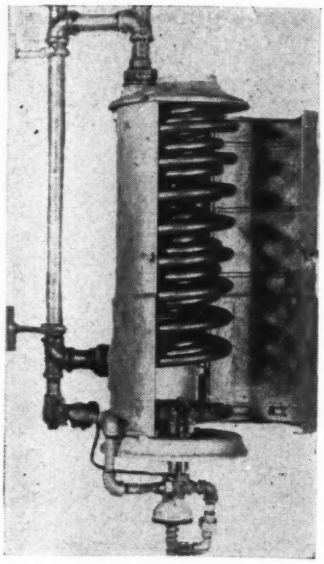


INSIST ON THE *New* HECO REGULATOR FOR PRECISION PERFORMANCE

New, too, is the line of HECO Precision Machined Brass Valves and Cocks. Write for prices, Catalog No. 47 G on the complete line, giving jobber's name.

TESTED AND ·HECO· PROVED PRODUCTS

HECKETHORN MANUFACTURING & SUPPLY CO.
LITTLETON, COLORADO, U.S.A.



THERMOSTATIC
INSTANTANEOUS
PATENTED

HOTOMATIC
GAS WATER HEATERS

The water heater that is in a class by itself—no storage tank is necessary. Should give 40 years continuous service.

Our Butane 100% Safety Pilot is the simplest on the market—easily understood by the customers.

No. 1 Heater—heats 60 g.p.h.
No. 2 Heater—heats 90 g.p.h.
No. 3 Heater—heats 180 g.p.h.
No. 3 Battery Heaters — for large quantities of water

Write for Folder and Prices or—Order One and Take Your Chance.

Many of these Heaters Have Been in Continuous Use for 17 Years.

Approved by
International Gas Association
Gas Combustion Engineers

Manufactured by

LITTLE GIANT WATER HEATER COMPANY
907 7th St. Orange, Texas

L. C. Roberts

L. C. ROBERTS, advertising supervisor, Lone Star Gas Co., Dallas, was elected president of the Dallas Advertising League at its annual election on May 30. The League is Dallas' oldest luncheon club and one of its largest. The new president, a member of the advertising group for 15 years, was selected as its most valuable member in 1945. He has been connected with Lone Star for 14 years, and some of his advertising won top honors for the company in PUAA and other competitions.

JAMES S. KNOWLSON, chairman of the board and president of Stewart-Warner Corp., Chicago, announced the re-election by the board on May 28 of the following officers: FRANK A. HITER, senior vice president; GEORGE L. MEYER, JR., LYNN A. WILLIAMS, JR., and ARDEN W. LeFEVRE, vice presidents; WILFRED REETZ, controller; FRED P. KIRCH, treasurer; ALBERT R. BENSON, secretary. The following corporation officials were reappointed: J. E. BURKE, assistant secretary; E. L. SANDBERG, assistant treasurer; JAMES I. MINTEER, OSCAR E. SPRING, EVERETT F. WALTHER AND ALFRED J. WEINSHEIM, assistant secretaries and treasurers.

R. H. Taylor

ROBERT H. TAYLOR was elected vice president in charge of sales of Florence Stove Co., Gardner, Mass., at a recent meeting of the board of directors. He was formerly general sales manager and has been associated with the firm's sales organization for 15 years, a good portion of the time as manager of the New York sales division. Taylor was appointed general sales manager several months ago, following the death in January of Harvey E. Golden.

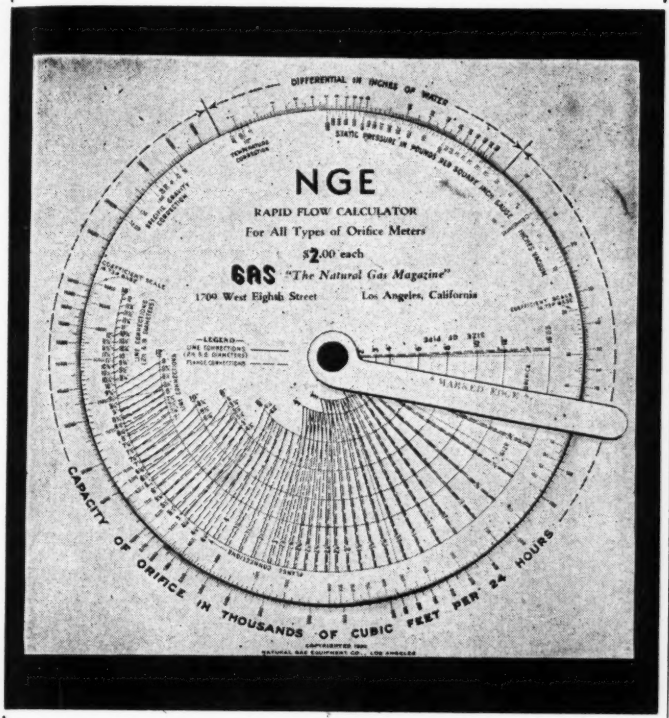
F. L. RICHARDSON is Lone Star Gas Co.'s general sales supervisor, a post which has just been created. He will assist the firm's distribution division managers in standardizing policies, efforts and methods in domestic and industrial sales, including both natural gas and butane. MISS JULIA HUNTER, home economics director, also will report directly to Richardson.

L. H. WEIRICH, A. O. Smith Corp., has been transferred to San Diego as the firm's representative in that area. He will operate as sales representative for Smithway water heaters, hot water storage tanks and other Smithway products, spending most of his time in San Diego, Orange and Imperial counties. His headquarters are at Room 735, Bank of America Bldg.

NGE RAPID FLOW

CALCULATOR

FROM 2 inches TO 16 inches


NGE
RAPID FLOW CALCULATOR
For All Types of Orifice Meters
$2.00 each
GAS "The Natural Gas Magazine"
1709 West Eighth Street Los Angeles, California
CAPACITY OF ORIFICE IN THOUSANDS OF CUBIC FEET PER 24 HOURS

. . . will quickly compute any of a series of variables in the transmission of natural gases.

SIMPLE to operate: Set dial . . . Turn indicator . . . *and instantly find*

1 COEFFICIENT and VOLUME
2 CORRECT ORIFICE SIZE IN ANY GIVEN VOLUME
3 DIFFERENTIAL PRESSURES

Our NGE CALCULATOR has been tested in field and desk use. Why not let it *help you* with your daily problems. If interested send in coupon and you will receive our calculator in a few days.

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$2.00 EACH
25% discount on all orders for 25 or more

Gentlemen: Please send me.....NGE *Gas Flow Orifice Calculators* for which I am enclosing my check or money order for $..... *Add 2½% sales tax in California.*

NAME .....

COMPANY .....

ADDRESS .....

Johns-Manville

TRANSITE FLUE PIPE

for domestic gas-burning appliances

An asbestos product—
IT'S COMPLETELY RUSTPROOF!
It's light in weight—
EASY TO HANDLE AND INSTALL!
Comes both
ROUND and OVAL
in a complete range of sizes and with a full line of fittings

Write for Brochure TR-13A
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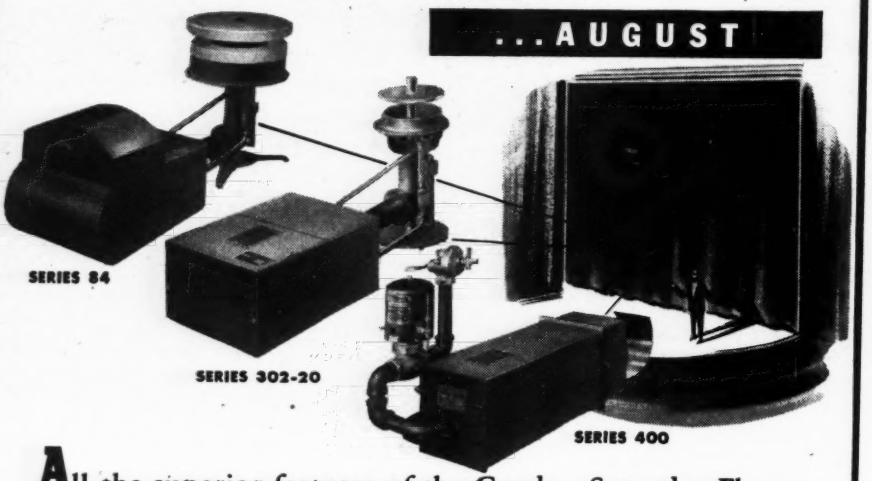
JOHNS-MANVILLE JM PRODUCTS

CURTAIN TIME

...AUGUST



All the superior features of the Gordon Spreader-Flame Conversion Burner and the engineering know-how behind it will be combined in a series of New Winter Air-Conditioning Units ready for your inspection in August.

ROBERTS-GORDON APPLIANCE CORP.
137 Arthur Street • Buffalo 7, N. Y.
Pioneers of the gas conversion industry and makers of "84", "302-20", "400" and Nordensson conversion burners

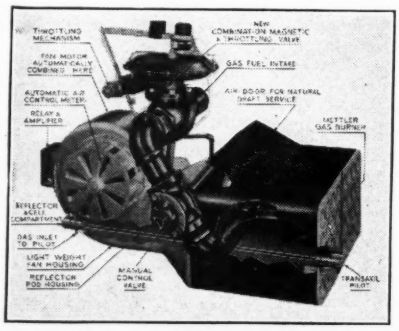
Immediate Delivery
METER CONNECTIONS
Straight Swivels and Nuts
Made of Screw-stock Steel, Electro-tinned
for use on 5-Lt. and 10-Lt. Meters
OTHER SIZES TO ORDER WRITE FOR PRICES
THE SCREWWERCS COMPANY
SYKESVILLE PENNSYLVANIA

Mettler "FAN-AIR" Gas Burner

Picture reveals essential and highly desirable POINTS of Fan-air mechanical draft gas burners. Not just a gas burner but a COMPLETE AND FULLY AUTOMATIC BURNER SYSTEM, factory tested and ready for application when received. It's the most modern gas burner and easier to install.

(NOTHING ELSE LIKE IT)

Sizes 5 to 300 H.P. Prompt Shipments
IDEAL FOR SCOTCH MARINE BOILERS



LEE B. METTLER CO.
406 SOUTH MAIN STREET ★ LOS ANGELES 13, CALIFORNIA

— OBITUARIES —

J. George Merkle

J. GEORGE MERKLE, 41, general supervisor of appliance sales and promotion for Southern California Gas Co., Los Angeles, died suddenly on May 9, following a heart attack which occurred just as he reached home from his office.

To fill the vacancy left by Merkle's death, F. M. FOSTER, former manager of commercial and industrial sales, has been named manager of residential sales and promotion. He will coordinate the work of J. L. HALL, general supervisor of residential gas; R. W. DOW, general supervisor of appliance sales; and H. M. O'HAVER, general supervisor of dealer sales. R. M. CROSBY, sales promotion assistant; T. G. GROSS, market analyst; and R. G. SMITH, office engineer, will be Foster's staff of assistants.

The position vacated by Foster will be filled by R. B. GROSSMAN, who was general supervisor of industrial sales. H. N. NASH, former division sales supervisor in Northern division, has moved into Grossman's place, and F. N. SEITZ, office engineer in the office of W. M. JACOBS, general sales manager, will fill Nash's position. C. N. ALEXANDER, of the Alhambra, Calif. office, replaces Seitz.

Merkle began his career with SoCal working in the engineering department in San Bernardino during the summer months, while still attending the University of Southern California. In 1931 he entered the sales department and the following year was transferred to Los Angeles, where he served as an appliance salesman, becoming assistant general supervisor of domestic sales in 1936. During the war he was loaned to the personnel department, where he acted as manpower coordinator, and was transferred back to sales in 1944 as general supervisor of appliance sales and promotion.

EDWARD DUFFY, former company engineer for Southern California Gas Co., died on May 15. He had been in retirement since 1930. A native of Ireland he came to the United States in the early 80's and worked for the Los Angeles Gas & Electric Co. and for SoCal continuously until his retirement.

RICHARD E. BRANSCOMB, also of Southern California Gas Co., died on May 16. He was unit supervisor, customers department, Los Angeles, until he went on the disability list in November, 1946. Except for a few months in 1906, Branscomb worked for SoCal and its predecessor from 1904 until his death.